Logon

*** It is now 1/21/2009 2:00:47 PM ***

Welcome to DialogLink - Version 5
Revolutionize the Way You Work!

New on Dialog

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Thomson File Histories are now available directly through *Dialog*. Combined with the comprehensive patent and trademark information on *Dialog*, file histories give you the most complete view of a patent or trademark and its history in one place. When searching in the following patent and trademark databases, a link to an online order form is displayed in your search results, saving you time in obtaining the file histories you need.

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- CLAIMS/Current Patent Legal Status (File 123)
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- Derwent Patents Citation Index (File 342)
- Derwent World Patents Index (for users in Japan) (File 352)
- Derwent World Patents Index First View (File 331)
- Derwent World Patents Index (File 351)
- Derwent World Patents Index (File 350)
- Ei EnCompassPat (File 353)
- European Patents Fulltext (File 348)
- French Patents (File 371)
- German Patents Fulltext (File 324)
- IMS Patent Focus (File 447, 947)
- INPADOC/Family and Legal Status (File 345)
- JAPIO - Patent Abstracts of Japan (File 347)
- LitAlert (File 670)
- U.S. Patents Fulltext (1971-1975) (File 652)

- U.S. Patents Fulltext (1976-present) (File 654)
- WIPO/PCT Patents Fulltext (File 349)
- TRADEMARKSCAN - U.S. Federal (File 226)

DialogLink 5 Release Notes
New features available in the latest release of DialogLink 5 (August 2006)

- Ability to resize images for easier incorporation into DialogLink Reports
- New settings allow users to be prompted to save Dialog search sessions in the format of their choice (Microsoft Word, RTF, PDF, HTML, or TEXT)
- Ability to set up Dialog Alerts by Chemical Structures and the addition of Index Chemicus as a structure searchable database
- Support for connections to STN Germany and STN Japan services

Show Preferences for details

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? Help Log On Msg
           *** ANNOUNCEMENTS ***
                   ***
*** FREE FILE OF THE MONTH: World News Connection (WNC), FILE #985
Each month Dialog offers an opportunity to try out new or
unfamiliar sources by offering $100 of free searching (either
DialUnits or connect time) in one specific file. Output and
Alerts charges are not included. For more details visit:
http://www.dialog.com/freefile/ and then take a moment to get
familiar with another great Dialog resource.

*** "Thomson File Histories" are now available directly through Dialog
in selected patent and trademark files.  Combined with the
comprehensive patent and trademark information on Dialog, file
histories give you the most complete view of a patent or trademark
and its history in one place. When searching in one of the patent
and trademark databases, a link to an online order form is displayed
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in your search results, saving you time in obtaining the file
histories you need.  See HELP FILEHIST for more information about
how to use the link and a list of files that contain the link.

NEW FILE
***File 651, TRADEMARKSCAN(R) - China.  See HELP NEWS 651 for details.

RESUMED UPDATING
***File 523, D&B European Financial Records
                   ***
RELOADS COMPLETED
***File 227, TRADEMARKSCAN(R) - Community Trademarks
                   ***
FILES RENAMED
***File 321, PLASPEC now known as Plastic Properties Database
                   ***
FILES REMOVED
***File 388,PEDS: Defense Program Summaries
***File 588,DMS-FI Contract Awards

>>>For the latest news about Dialog products, services, content<<<
>>>and events, please visit What's New from Dialog at          <<<
>>>http://www.dialog.com/whatsnew/.  You can find news about   <<<
>>>a specific database by entering HELP NEWS <file number>.    <<<

? Help Off Line
* * *
Connecting to Scott Jarrett - Dialog - 276702
Connected to Dialog via SMS002302390

?  b 411
> Set Files all
> Select (RICKETTS (n2)( JOHN or ARTHUR ))  and (IBM or outsourc?? or simulat??) not
py>2004
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10 databases have items, of 512 searched.
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Hits	File	Name
1	9	Business & Industry(R) Jul/1994-2009/Jan 20
1	16	Gale Group PROMT(R) 1990-2009/Jan 01
1	148	Gale Group Trade & Industry DB 1976-2009/Jan 07
1	262	CBCA Fulltext 1982-2009/Jan W3
1	484	Periodical Abs Plustext 1986-2009/Dec W2
2	570	Gale Group MARS(R) 1984-2009/Jan 01
1	633	Phil.Inquirer 1983-2009/Jan 21
2	660	Federal News Service 1991-2002/Jul 02
1	716	Daily News Of L.A. 1989-2008/Dec 06
2	996	Newsroom 2000-2003

Estimated Cost Summary

Project		Client		Charge Code		Searcher		Job		Service Code	User Number
						Scott Jarrett				51	276702
Date		Time		SessionID		Subsession		Subaccount			
01/21/2009		14:14:27		167		3					
Data Base	Dial Units	Access Charge	Print Credit	Types	Prints	Report	Rank	Links	CSS	Total	
411	42.2770	124.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	124.29	
Sub Totals	42.2770	$124.29	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$124.29	
Session Totals	42.6350	$124.31		Telecom	$3.60					$127.91	

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Begin 9,16,148,262,484,570,633,660,716,996
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[File 9] Business & Industry(R) Jul/1994-2009/Jan 20

[File 16] Gale Group PROMT(R) 1990-2009/Jan 01

**File 16: Because of updating irregularities, the banner and the update (UD=) may vary.*

[File 148] Gale Group Trade & Industry DB 1976-2009/Jan 07

**File 148: The CURRENT feature is not working in File 148. See HELP NEWS148.*

[File 262] CBCA Fulltext 1982-2009/Jan W3

[File 484] Periodical Abs Plustext 1986-2009/Dec W2

[File 570] Gale Group MARS(R) 1984-2009/Jan 01

[File 633] Phil.Inquirer 1983-2009/Jan 21

[File 660] Federal News Service 1991-2002/Jul 02

**File 660: This file no longer updates*

[File 716] Daily News Of L.A. 1989-2008/Dec 06

[File 996] Newsroom 2000-2003


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SELECT (RICKETTS (n2)( JOHN or ARTHUR )) and (IBM or outsourc?? or simulat??) not py>2004

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        23133   RICKETTS

      8329726   JOHN

       663461   ARTHUR

          388   RICKETTS(2N)(JOHN OR ARTHUR)

      1069740   IBM

       325446   OUTSOURC??

       309480   SIMULAT??

     12728739   PY>2004

S1         13   SELECT (RICKETTS (N2)( JOHN OR ARTHUR )) AND (IBM OR OUTSOURC?? OR
SIMULAT??) NOT PY>2004
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? rd

>>>W: Duplicate detection is not supported for File 660.

Records from unsupported files will be retained in the RD set.

S2 11 RD (UNIQUE ITEMS)

? t s2/ti/all

2/TI/1 (Item 1 from file: 9)
Business & Industry(R)

Lazarus raises O&M

2/TI/2 (Item 1 from file: 16)
Gale Group PROMT(R)

Ogilvy builds on blue chips.(CEO of Ogilvy & Mather Worldwide marketing strategy)(Statistical Data Included)

2/TI/3 (Item 1 from file: 148)
Gale Group Trade & Industry DB

World airline directory. (Directory)

2/TI/4 (Item 1 from file: 262)
CBCA Fulltext

Canadian consulting engineering awards 1998

2/TI/5 (Item 1 from file: 484)
Periodical Abs Plustext

Ogilvy builds on blue chips

2/TI/6 (Item 1 from file: 570)
Gale Group MARS(R)

Lazarus raises O&M: Ogilvy prevails as Ad Age's best ad agency in 2001. (North America).(Brief Article)

2/TI/7 (Item 1 from file: 633)
Phil.Inquirer

A WILDLIFE ADVENTURE SET AGAINST A VAST PANORAMA

2/TI/8 (Item 1 from file: 660)
Federal News Service

GENERAL NEWS EVENTS

MONDAY, AUGUST 17, 1998
Event: REPORT - NATIONAL RESEARCH COUNCIL (NRC)
CONFERENCE - SHARE, AN INTERNATIONAL ASSOCIATION OF PERSONAL COMPUTER USERS AND ORGANIZATIONS, AND GUIDE INTERNATIONAL, AN IBM INFORMATION TECHNOLOGY MANAGEMENT USER GROUP
CONFERENCE - MILLER FREEMAN SOFTWARE DEVELOPMENT
CONFERENCE - AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS (AICPA)
CEREMONY - DEFENSE DEPARTMENT
LECTURE - NATIONAL BUILDING MUSEUM
SEMINAR - FIRST CLASS
SEMINAR - FIRST CLASS
FILM - BORDERS BOOKSTORE
SEMINAR - FIRST CLASS

2/TI/9 (Item 2 from file: 660)
Federal News Service

GENERAL NEWS EVENTS

MONDAY, AUGUST 17, 1998
Event: REPORT - NATIONAL RESEARCH COUNCIL (NRC)
CONFERENCE - SHARE, AN INTERNATIONAL ASSOCIATION OF PERSONAL COMPUTER USERS AND ORGANIZATIONS, AND GUIDE INTERNATIONAL, AN IBM INFORMATION TECHNOLOGY MANAGEMENT USER GROUP
CONFERENCE - MILLER FREEMAN SOFTWARE DEVELOPMENT

CONFERENCE - AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS (AICPA)
CEREMONY - DEFENSE DEPARTMENT
LECTURE - NATIONAL BUILDING MUSEUM
SEMINAR - FIRST CLASS
SEMINAR - FIRST CLASS
FILM - BORDERS BOOKSTORE
SEMINAR - FIRST CLASS

2/TI/10 (Item 1 from file: 716)
Daily News Of L.A.

CIRCUS OF DREAMS For performers, big top becomes the center stage of their lives

2/TI/11 (Item 1 from file: 996)
Newsroom 2000-2003

Ogilvy builds on blue chips

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?  b 411
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Estimated Cost Summary

Project	Client	Charge Code	Searcher	Job	Service Code	User Number
			Scott Jarrett		51	276702

Date	Time	SessionID	Subsession	Subaccount
01/21/2009	14:16:02	167	5	

Data Base	Dial Units	Access Charge	Print Credit	Types	Prints	Report	Rank	Links	CSS	Total
9	0.0890	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
16	0.3760	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.10
148	0.5700	3.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18
262	0.0790	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46
484	0.1660	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84
570	0.0530	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
633	0.0530	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
660	0.0210	0.02	0.00	2.68	0.00	0.00	0.00	0.00	0.00	2.70
716	0.0320	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
996	0.7200	3.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.17

Sub Totals	2.1590	$10.65	$0.00	$2.68	$0.00	$0.00	$0.00	$0.00	$0.00	$13.33
Session Totals	45.1410	$138.90		Telecom	$0.40					$141.98

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> Set Files all

> Select (outsouring and (saving? or benefit? or value?) (n2) (model?? or simulat??) and
(IT or (information () technology)) not py>2003

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No databases have items, of 512 searched.
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1 database has items, of 512 searched.

Hits	File	Name
1	15	ABI/Inform(R) 1971-2009/Jan 20

Estimated Cost Summary

Project		Client		Charge Code		Searcher		Job		Service Code	User Number
						Scott Jarrett				51	276702
Date		Time		SessionID		Subsession		Subaccount			
01/21/2009		14:33:25		167		6					
Data Base	Dial Units	Access Charge	Print Credit	Types	Prints	Report	Rank	Links	CSS	Total	
411	43.1380	126.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	126.83	
Sub Totals	43.1380	$126.83	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$126.83	
Session Totals	88.3940	$269.37		Telecom	$4.62					$273.99	

Begin 15

[File 15] ABI/Inform(R) 1971-2009/Jan 20

SELECT outsouring and (saving? or benefit? or value?) (n2) (model?? or simulat??) and (IT or (information () technology)) not py>2003

21 OUTSOURING

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        216009   SAVING?
        555795   BENEFIT?
        605721   VALUE?
        503361   MODEL??
         27333   SIMULAT??
         10851   ((SAVING? OR BENEFIT?) OR VALUE?)(2N)(MODEL?? OR SIMULAT??)
       1966673   IT
        780298   INFORMATION
        597952   TECHNOLOGY
         91102   INFORMATION(W)TECHNOLOGY
        757211   PY>2003
S1           1   SELECT OUTSOURING AND (SAVING? OR BENEFIT? OR VALUE?) (N2) (MODEL?? OR
SIMULAT??) AND (IT OR (INFORMATION () TECHNOLOGY)) NOT PY>2003


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1/3,K/1
ABI/Inform(R)

01830634   04-81625
Effect of partnership quality on IS outsourcing: Conceptual framework and empirical validation

Lee, Jae-Nam; Kim, Young-Gul
Journal of Management Information Systems: JMIS   v15n4 pp: 29-61
Spring 1999
ISSN: 0742-1222 Journal Code: JMI
Word Count: 8148
Text:

...failed to address the fact that the economies of scale and scope achieved by IS outsouring may vary significantly depending on the environment, structure, and strategy factors [20, 43]. To overcome...

...about outsourcing partnership by distinguishing the components of partnership quality from the variables that influence it. We also examine the relationship between partnership quality and outsourcing success through an integrated theoretical...quality and its determinants. So far, past research has failed to notice this relationship because it has not distinguished between the elements of partnership quality and its antecedent conditions. The second...

...as having two dimensions: (1) fitness of use oes the product or service

do what it is supposed to do? Does it possess the features that meet the customer's needs? and (2) reliability-To what extent... literature does not explicitly distinguish the components of partnership quality from the factors that affect it. Here, we introduce the factors from the previous literature as potential determinants of partnership quality...

...Heide and John [24] define joint action as "the degree of interpenetration of organizational boundaries." It indicates that organizational boundaries become penetrated by the integration of activities such as long-range planning, product design, value analysis, design of quality control, training, and education. Therefore, it can provide a mechanism for negotiating and agreeing on mutual benefits, and for creating a...

...turn should make each party more confident in the relationship and more willing to keep it alive [3]. Communication quality is treated as an antecedent of trust in the previous literature...

...and partnership quality.

Coordination

Good coordination is nearly invisible; we notice coordination most clearly when it is absent from the interorganizational relationship [36]. Anderson and Narus [2] suggest that successful working...

...perception of its dependency on the partner firm relative to the partner's dependency on it. Mutual dependency between participants increases when the size of the exchange and importance of exchange...

...participants do not have similar organizational cultures, their relationship may create divergent values that make it difficult for them to trust one another and provide a fundamental cause to destroy the... to the ability of a firm to focus on its core business by outsourcing routine information technology (IT) activities.
Economic benefits refer to the ability of a firm to use expertise and economies...

...Technological benefits refer to the ability of a firm to gain access to leading-edge IT and to avoid the risk of technological obsolescence that results from dynamic changes in IT.

User Perspective

From a user perspective, outsourcing success may also be the level of quality...

...of the quality of service frequently leads to higher costs and lower user satisfaction. Therefore, it is imperative to conduct a proper analysis of the service quality before building a relationship...new observations [44]. Table 6 contains the coefficients and t-values resulting

from the regression model. Because the value of the estimated coefficients may not be stable, we examined the normality and homoscedasticity for...

...sharing and the components of partnership quality, information sharing was negatively related to conflict, while it was positively associated with commitment. However, information sharing was not significantly related to trust, business...is supported. Top management support also was significantly associated with trust and business understanding, while it was not related to benefit and risk share, conflict, or commitment.

Outsourcing Success

As proposed...

...as with overall outsourcing success. Trust showed a strong positive relationship with business satisfaction, while it had no effect on user satisfaction. This indicates that trust is a critical predictor of...

...the result with trust, business understanding was not a good predictor of business satisfaction while it significantly influenced user satisfaction. This means that the outsourcing outcome matched the users' requirements as...
...as well as with overall outsourcing success. Although conflict was a predictor of business satisfaction, it had no effect on the overall outsourcing success and user satisfaction. Our finding for the...

...outsourcing success. The result shows that partnership quality and outsourcing success have a strong relationship. It indicates that fostering a cooperative relationship based on trust, business understanding, benefit and risk share...

...quality on outsourcing success, we introduced two concepts, business satisfaction and user satisfaction of outsourcing. It was the first attempt to measure outsourcing success in terms of both the business and...

...providers, while their relationship period continues to be extended.

According to Fitzgerald and Willcocks [16], it is difficult to maintain partnerships in the field of outsourcing due to an asymmetry of...

...to outsourcing success [16, 25, 31]. Our own results on cultural similarity, however, indicate that it does not significantly increase the quality of partnership. Instead, in the repeated relationship, cultural similarity...to enjoy sustainable competitive advantages over their rivals.
This study has the following limitations: First, it was a kind of snapshot research that did not consider the feedback effect of partnership ...31-41.

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...Reference:

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Reference:

47...Administrative Science Quarterly, 29 (1984), 373-391. 54. Willcocks, L.; Lacity, M.; and Fitzgerald, G. Information technology outsourcing in Europe and the USA: Assessment issues. International Journal of Information Management, 15, 5...

...University of Minnesota. His active research areas are IS architecture development, data and process modeling, IT management, and knowledge management. His publications have appeared in journals such as Communications of the...

? b 411

Estimated Cost Summary

Project		Client		Charge Code		Searcher		Job		Service Code	User Number
						Scott Jarrett				51	276702
Date		Time		SessionID		Subsession		Subaccount			
01/21/2009		14:34:10		167		8					
Data Base	Dial Units	Access Charge	Print Credit	Types	Prints	Report	Rank	Links	CSS	Total	
15	1.0100	5.64	0.00	1.77	0.00	0.00	0.00	0.00	0.00	7.41	
Sub Totals	1.0100	$5.64	$0.00	$1.77	$0.00	$0.00	$0.00	$0.00	$0.00	$7.41	
Session Totals	89.7500	$279.97		Telecom	$0.18					$281.91	

> Set Files all

> Select ellram and outsourc??

18 databases have items, of 512 searched.

Hits	File	Name
1	9	Business & Industry(R) Jul/1994-2009/Jan 20
2	11	PsycINFO(R) 1887-2009/Jan W2
33	13	BAMP 2009/Jan 20
151	15	ABI/Inform(R) 1971-2009/Jan 20
1	47	Gale Group Magazine DB(TM) 1959-2009/Jan 13
2	75	TGG Management Contents(R) 86-2009/Dec W3
6	88	Gale Group Business A.R.T.S. 1976-2009/Jan 21
41	148	Gale Group Trade & Industry DB 1976-2009/Jan 07
1	262	CBCA Fulltext 1982-2009/Jan W3
27	484	Periodical Abs Plustext 1986-2009/Dec W2
1	485	Accounting & Tax DB 1971-2009/Jan W1
14	990	NewsRoom Current Sep 01-2009/Jan 20
36	991	NewsRoom 2008 Jan 1-2008/Aug 31
32	992	NewsRoom 2007
11	993	NewsRoom 2006
4	994	NewsRoom 2005
7	995	NewsRoom 2004
16	996	Newsroom 2000-2003

Estimated Cost Summary

Project		Client		Charge Code		Searcher		Job		Service Code	User Number
						Scott Jarrett				51	276702
Date		Time		SessionID		Subsession		Subaccount			
01/21/2009		14:35:20		167		9					
Data Base	Dial Units	Access Charge	Print Credit	Types	Prints	Report	Rank	Links	CSS	Total	
411	2.6760	7.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.87	
Sub Totals	2.6760	$7.87	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7.87	
Session Totals	92.5380	$290.43		Telecom	$0.29					$290.71	

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Begin 9,11,13,15,47,75,88,148,262,484,485,990,991,992,993,994,995,996
```

[File 9] Business & Industry(R) Jul/1994-2009/Jan 20

[File 11] PsycINFO(R) 1887-2009/Jan W2

**File 11: The file has been reloaded. Accession numbers have changed.*

[File 13] BAMP 2009/Jan 20

[File 15] ABI/Inform(R) 1971-2009/Jan 20

[File 47] Gale Group Magazine DB(TM) 1959-2009/Jan 13

[File 75] TGG Management Contents(R) 86-2009/Dec W3

[File 88] Gale Group Business A.R.T.S. 1976-2009/Jan 21

[File 148] Gale Group Trade & Industry DB 1976-2009/Jan 07

**File 148: The CURRENT feature is not working in File 148. See HELP NEWS148.*

[File 262] CBCA Fulltext 1982-2009/Jan W3

[File 484] Periodical Abs Plustext 1986-2009/Dec W2

[File 485] Accounting & Tax DB 1971-2009/Jan W1

[File 990] NewsRoom Current Sep 01-2009/Jan 20

[File 991] NewsRoom 2008 Jan 1-2008/Aug 31

[File 992] NewsRoom 2007

[File 993] NewsRoom 2006

[File 994] NewsRoom 2005

[File 995] NewsRoom 2004

[File 996] Newsroom 2000-2003


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SELECT ellram and outsourc??

          1566   ELLRAM

        546418   OUTSOURC??
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S1        386   SELECT ELLRAM AND OUTSOURC??


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?  rd

S2        247   RD  (UNIQUE ITEMS)


?  s s2 and tco

          247   S2

        37889   TCO

S3         10   S S2 AND TCO


?  t s3/ti/all
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3/TI/1 (Item 1 from file: 13)
BAMP

A multidimensional framework for understanding outsourcing arrangements.

3/TI/2 (Item 2 from file: 13)
BAMP

What is SCM? And, where is it?

3/TI/3 (Item 1 from file: 15)
ABI/Inform(R)

A PRACTITIONER'S DECISION MODEL FOR THE TOTAL COST OF OUTSOURCING AND APPLICATION TO CHINA, MEXICO, AND THE UNITED STATES

3/TI/4 (Item 2 from file: 15)
ABI/Inform(R)

A Multidimensional Framework for Understanding Outsourcing Arrangements

3/TI/5 (Item 3 from file: 15)
ABI/Inform(R)

Evaluating the Performance of Third-Party Logistics Arrangements: A Relationship Marketing Perspective

3/TI/6 (Item 4 from file: 15)
ABI/Inform(R)

THE RELATIONSHIP BETWEEN PURCHASING AND SUPPLY MANAGEMENT'S PERCEIVED VALUE AND PARTICIPATION IN STRATEGIC SUPPLIER COST MANAGEMENT ACTIVITIES

3/TI/7 (Item 5 from file: 15)
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Supply chain management: Definition, growth and approaches

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Total cost of relationship: An analytical framework for the logistics outsourcing decision

3/TI/9 (Item 7 from file: 15)
ABI/Inform(R)

Total cost of ownership: An analysis approach for purchasing

3/TI/10 (Item 1 from file: 148)
Gale Group Trade & Industry DB

What is SCM? And, where is it?(Institute for Supply Management; literature review)

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Total cost of relationship: An analytical framework for the logistics outsourcing decision

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Abstract:

Traditional outsourcing decisions have emphasized such objective costs as invoice prices and internal direct expenses as key decision drivers. The focus solely on measurable costs can lead to poor decision making where service and other nonprice issues may vary significantly among third party providers. It is argued that logistics must pay special attention to nonprice issues, because logistics service performance is critical to overall customer satisfaction. A generalized version of total cost ownership is an organized method of considering nonprice issues in the logistics outsourcing decision.

Text:

In principle, the issue of whether to outsource such logistics functions as transportation, warehousing, and order processing is a variation on the traditional "make-or-buy" decision. Make-or-buy is really a shorthand term for the crucial decision of how a firm obtains goods and services. If the company determines that the open market is the best source for a particular component or support service, then the firm should buy the item or service. If the company decides that the part or function should be supplied by company employees, then the firm has taken the "make" choice.

As the name implies, formal make-or-buy analysis began in a manufacturing context,' where the question is whether a product's component parts should be bought from a supplier or produced in-house. Both operations management2 and purchasing texts3 routinely treat this decision as a cost minimization issue. One compares the supplier's quote to internal costs and chooses the less expensive alternative. Perceived differences in quality, delivery reliability, responsiveness, and similar issues are sometimes quantified, but often these nonprice issues are treated separately. Recently, students

of manufacturing have begun to investigate the importance of the component make-or-buy decision to overall manufacturing strategy and competence.4 Management scholars have also pointed out that the make-or-buy decision can have corporate strategy implications since employment levels, asset levels, and core competencies are involved.5

A number of companies have used Total Cost of Ownership (TCO) procedures to incorporate nonprice considerations into the make/buy decision.6 We believe that TCO is an excellent starting point for analyzing logistics outsourcing issues. However logistics, especially finished goods distribution, is vitally concerned with external customers and services, rather than internal customers and products. Since logistics deals with services rather than parts, any outsourcing analysis must account for managing a third-party process from initial loading to final delivery. In contrast, component outsourcing involves inspection costs at a point in time, often at the supplier's shipping dock or the factory's receiving dock. Logistics' focus on external customers entails data gathering over time on both third-party performance and customer satisfaction. Buyers managing component outsourcing receive direct feedback from a single source: the manufacturing function they supply.

For these reasons, we propose a major modification of the Total Cost of Ownership framework, which we call Total Cost of Relationship (TCR), to deal with logistics outsourcing decisions. The thrust of this modification is to account for extra interface, quality measurement, and customer satisfaction costs over and above what is considered in the typical make-or-buy analysis. The paper develops these themes in three sections. The first section elaborates on the inherent differences between the component make-or-buy decision and the logistics outsourcing decision. We pay particular attention to the costs involved because logistics services two interfaces: shipper/third party, and third party/ final customer. Having identified the key differences in outsourcing logistics vs. outsourcing components, we show how these differences influence the analysis which precedes the outsourcing decision. The second section comprises an example of the additional areas addressed by a Total Cost of Relationship analysis. The third section points out the implications of a more complete analysis for the outsourcing decision process.

COMPONENT MAKE/BUY VS. LOGISTICS SERVICES PERFORM/PURCHASE

(Table Omitted)

Captioned as: TABLE 1

Table 1 is a summary of differences between logistics and component outsourcing. The most fundamental difference is that logistics outsourcing involves acquiring a process rather than a discrete quantity of parts. In distribution, for instance, the third party does not supply an individual part or component, but rather a series of transactions that, in the routine order situation, begins with the receipt of the customer order and ends with delivery. If distribution is performed by a logistics supplier, the process must include at least two external interfaces: service buyer/third party (Figure 1, Interface 1) and thirdparty supplier/ultimate customer

(Figure 1, Interface 2). In fact, several interfaces may exist because there are multiple third-party suppliers, e.g., a third-party warehouse handing goods over to a for-hire transportation company. In contrast, the component buyer is faced with a single point of contact, as illustrated by

Interface A in Figure 1. Issues and problems are addressed directly with the firm providing the components and material that go into the manufactured product.

Besides handling multiple external interfaces, logistics managers must monitor service over time. Services are inherently more variable and "people-dependent" than manufactured products.7 Thus tracking service interactions-shipping dock to carrier, carrier to customer, etc.-often implies systems and procedures that can provide information at any point in the logistics process. In contrast, purchasing can manage to specific results. A buyer needs to know only that the order has been placed and adequate quality product received, relying on the supplier to assure quality through conformance to physical standards or specifications. Logistics also has responsibility for a customer order from order entry through final delivery, a time period that can range from hours to weeks. Logistics skills, systems, and organizations are all set up to initiate and monitor a series of service interactions over time. Except for emergencies, purchasing may only be involved at two points in the supply process-initiating the purchase order, and verifying final receipt. Even when purchasing specifies the carrier to be used for delivery, it is typically the supplier's responsibility to work with the carrier and ensure on-time service.

We suggest, then, that the usual make/buy decision is different for logistics because the logistics function is involved with buying a service process, rather than a shipment of components. The difference in the nature of the purchase has implications that are summarized in Table 1, and which we now present in more detail. Customer Satisfaction

(Chart Omitted)

Captioned as: FIGURE 1

Logistics on the distribution side involves a direct connection to customers. Monitoring and control of customer contact, whether made by third parties or company personnel, is clearly a high priority for any firm. Also, both the outsourcing firm and that firm's final customer often demand total visibility of the distribution process, from order placement to ultimate delivery. Many studies have documented the importance of prompt, accurate information to customer perceptions of service quality.8 The total cost of third-party logistics should include expenses for monitoring and recording supplier service to the final customer, whether by requesting proof of delivery, sampling order cycle time components, or other means. Ideally, this monitoring should be automated to minimize expense, but no firm will want to be disconnected from customer feedback. In addition, the outsourcing firm will need to monitor third-party

performance. Before outsourcing, shippers incur costs to determine customer satisfaction and to administer and measure the internal logistics process. After outsourcing, shippers will still spend to determine customer satisfaction, but supplier measurement cost replaces employee monitoring cost.

Component outsourcers (usually Purchasing) face different issues. The trend in purchasing has been to eliminate monitoring costs by certifying suppliers and doing away with incoming inspections. The communications link between two internal functions, such as manufacturing and purchasing, should be much more direct than between a firm and its customers. Furthermore, component failure, especially in Just-In-Time systems, will immediately disrupt the production process. Incremental, specialized

monitoring and control systems are not needed for the component purchasing process.

We expect monitoring costs to play a much larger role in logistics outsourcing than in component outsourcing. External customer satisfaction is more difficult to track, and feedback is often less immediate. Servicing the shipper/logistics provider interface remains a shipper's cost of doing business. Even if the shipping firm does not own logistics assets, monitoring costs remain. One facet of the logistics perform-or-purchase decision is deciding whether in-house logistics, with all the associated asset and management costs, is significantly cheaper to monitor because company employees are more easily measured than third parties.

Multiple Interfaces

As shown in Table 1 and Figure 1, a firm using logistics third parties must manage at least two external relationships. If distribution functions are being

outsourced, the relevant dyads are logistics buyer/logistics supplier and logistics supplier/final customer. If materials management or inbound logistics is contracted out, the key interfaces are buyer/logistics supplier and logistics supplier/material supplier. The product-oriented TCO framework must be expanded to include the relationship costs associated with these interfaces. The literature suggests several ways to classify and address both logistics buyer/logistics supplier relationship costs and logistics supplier/final customer relationship costs.

Logistics buyer/logistics supplier interface costs

Ellram and Siferd9 detailed the activities purchasing performs to acquire goods. They suggested six general drivers of total acquisition costs-quality, management, delivery, service, communications, and price. A modified version of this framework (Table 2) can be used to evaluate costs at the first interface-logistics buyer/logistics supplier. Differences between typical purchasing and logistics activities are highlighted in bold lettering in Table 2.

(Table Omitted)

Captioned as: TABLE 2

The differences between activities related to managing logistics providers vs. managing parts suppliers revolve around two themes-responsibility and process. Overseeing the delivery of several hundred different orders to multiple customer sites is inherently different than accepting delivery of several hundred parts at a limited number of manufacturing plants. Logistics has responsibility for the entire order life cycle, while purchasing often shifts responsibility for the delivery cycle to suppliers. As long as purchased components arrive on time with acceptable quality and cost, purchasing has fulfilled its mission. Logistics personnel also have to manage a process because the ultimate customer holds the shipper, not the third party, responsible for the timeliness, visibility, and responsiveness that constitute good customer service. Hence logistics' emphasis is on coordination with suppliers, continual service monitoring, and other process issues. Table 2 identifies six types of cost drivers that can result in different cost structures for logistics procurement compared to parts buying. Each of these categories is discussed below.

1. Management
As Table 2 indicates, purchasing and logistics managers have to set strategy, train departmental and other company personnel, and manage day-to-day personnel performance. However, because logistics looks down the supply chain to the final customer, the logistics group must actively monitor and supervise the performance of outside carriers, warehouses, etc. Purchasing may be able to issue a blanket purchase order and then insist that the supplier ship to support a published production schedule. In contrast, logistics departments must react directly to external demand, which implies scheduling, to some extent, at the customer's convenience. Also, logistics third parties must customize delivery schedules and associated services (e.g., inside delivery) to satisfy the shipper's final customers. Logistics has to work with third parties on a daily basis to respond to external customer demands; in contrast, purchasing can control its interactions with suppliers because purchasing is the customer as far as the supplier is concerned.

These differences mean that standard make-or-buy costing has to be supplemented. Any third-party study is incomplete without estimated costs for 1) real-time electronic linkages to logistics service providers and 2) customer access to real-time order/shipment data. Headcount projections, even with "complete" outsourcing, should include internal resources to insure third-party responsiveness to requests from customers and sales personnel.
2. Quality: Definition and Measurement

The difference between logistics outsourcing and the standard make-or-buy is especially pronounced in the quality area. Components have very concrete requirements, dictated by the need to fit with other components and production equipment capabilities. Component quality definition and

measurement starts with conformance to such objective specifications. Professional purchasers often use a "statement of work" to specify service and quality requirements for tangible purchases. Failure costs can be quantified through reject costs, labor expense due to downtime, etc.

On the other hand, service quality has multiple facets' ranging from hard measures such as on-time delivery and order fill rates to softer constructs like customer satisfaction and personnel responsiveness. These soft aspects are important to the make-or-buy or supplier selection decision for services." The challenge is to somehow combine the hard and soft measures which are associated with logistics services. The ideal procedure is to estimate the cost for various kinds of service failures, estimate the probability of failure under both internal and third-party logistics organizations, and then estimate the cost of service recovery under both internal and third-party regimes.

Unfortunately, even leading-edge firms do not claim to measure these various components exactly.12 In practice, companies attempting to address these issues usually do company-specific, or even customer segment-specific studies and/or controlled experiments.13 Another frequently used approach is to get consensus among key managers as to the likely risks, costs, and benefits involved in outsourcing.14 Still other organizations use weighting schemes to combine "hard" factors such as price with softer measures like customer satisfaction.15 The challenge is to get consensus on the soft factors to be evaluated and the weighting of each factor.

3. Other Differences: Delivery, Price, Communication, and Service Although most pronounced in the quality area, the component/logistics service dichotomy also affects the other cost drivers shown in Table 2. In the delivery category, purchasing incurs a cost of accepting a components shipment and correcting orders shipped in error, and this cost is part of a correctly performed make/buy analysis. In the parallel outbound case, internal logistics personnel will still have to tell the carrier about the change in receiving area because of construction, or the need to deliver the promotional shipment for the Saturday morning clearance sale. Costs to communicate customer needs from sales and/or customer service will have to be included in outsourcing cost evaluations. In the price category, logistics contract negotiations have to provide for much shorter reaction times than components contracts. Where parts lead times are often weeks or months, warehouses are routinely expected to pick, ship, and deliver orders within days. Specific shipping schedules are rarely forwarded to trucking companies. Such flexibility is simply a cost of doing business when one's own employees are available, but understanding how much flexibility to budget for is critical to prospective logistics service providers.

Finally, as noted above communications needs are different for logistics managers. The emphasis on tracking external activities (e.g., proof of delivery for customers) adds complications not associated with component purchase procedures. The costs to track third-party activities need to be included in Total Cost of Relationship calculations.

Logistics Supplier/Final Customer Interface Costs

Unlike TCO, TCR makes explicit provision for monitoring an interface where no company employees participate-the logistics supplier/final customer transaction. When third-party logistics companies are used, the customer's last interaction is with the third party, not the shipper's employees. Therefore, logistics will always have a keen interest in the interface between third-party provider and final customer. In contrast, purchasing departments deal with company employees since these employees ultimately receive and use the purchased product.

1. Retained customer interface costs

Before outsourcing, the shipper's own personnel would be directly in contact with the final customer at least for order entry and sometimes even for final delivery. After outsourcing, day-to-day customer information may have to come through the third party, or the company sales force may take on new duties, or perhaps third-party information providers can be engaged. What happens, for example, when a driver-sales force is replaced by third-party transportation? Who scans the shelves for competitor inroads, makes certain that promotions are carried out, works with receiving to insure product rotation, etc.? Costs to perform these functions must be incorporated in the Total Cost of Relationship analysis.

Evaluating customer contact and environmental scanning costs is especially important because outsourcing customer interface functions is one of the the hardest "sells" in a manufacturing organization. 16 We would recommend that prospective outsourcers specify what final customer feedback they expect from third parties. At a minimum, some shippers are asking for shipping notices, delivery records, immediate discrepancy reporting, and other information necessary to monitor third party/customer interaction. Any outsourcing proposal should budget resources to handle this information from the third party and distribute the information to manufacturing, sales, and marketing groups within the shipping organization.

2. Decision-Maker Differences

Traditionally, the purchasing function has not participated in logistics sourcing decisions,17 so it is not surprising that TCQ a tool developed for purchasing, requires modification to be applied to logistics suppliers. In particular, logistics executives report very little interaction with the purchasing/procurement function,'8 probably because the physical distribution (later logistics) function has defined itself as an arm of marketing, rather than an extension of the production process.' In fact, none of the respondents to a recent logistics survey identified themselves as in the Purchasing area." Logistics sees itself as a provider of customer service,21 although cost control is important.22 Standard

TCO procedures, which emphasize concerns such as "renewals, replacements, general maintenance..."23 must be modified to accommodate the customer orientation of logistics executives.

Logistics decision makers are likely to demand an in-depth analysis of qualitative issues before committing themselves to outsourcing. Numerous logistics studies continue to show that customer service capabilities dominate cost in the logistics outsourcing decision.24 Unfortunately, as noted above, quantifying the benefits and risks of customer service remains uncharted territory. For purchasing managers, TCO is a helpful framework for better evaluating the key decision criterion, cost, in component make/buy decisions.25 But when purchasing has a problem, the voice on the telephone is a company employee. But if logistics has a problem, the voice is a customer who can withdraw his/her business. Therefore, logistics must look at the Total Cost of (the third-party) Relationship, rather than the Total Cost of (internal component) Ownership.

Summary

Any logistics outsourcing analysis must include qualitative factors which are often not part of the traditional make-or-buy investigation. Monitoring costs for both shipper/ third-party and third-party/customer interactions must be included. Customer feedback mechanisms must be investigated, if the company's own employees no longer have direct customer contact. Visibility of the whole customer service process must be costed out, assuming that the information will have to be gathered from third parties and customers themselves. Finally, any logistics outsourcing analysis must reflect the logistics manager's orientation toward service at (almost) any cost, vs. the traditional cost minimization approach shown in purchasing textbooks. Total Cost of Ownership procedures are compatible with many of logistics' concerns, but still reflect their origin in product procurement decisions. The next section of this paper lays the conceptual foundation for changing TCO to make it specifically applicable to logistics services outsourcing decisions.

APPLYING TCO/TCR TO THE LOGISTICS OUTSOURCING DECISION

Ellram26 outlines a "10-Step Approach to Implementing TCO Analysis." This section adapts the 10-step approach to the specific issue of outsourcing logistics functions or Total Cost of Relationship analysis. An overview of this modified approach can be found in Table 3. The suggested changes take into account the logistics requirements to focus on the end customer, manage dual interfaces, provide order to delivery shipment visibility, and function as the last stage in product marketing. As Ellram notes,27 purchasing has frequently been the driver in applying TCO methodology to operational, tactical, and strategic decisions. The difference in functional leadership and orientation between Purchasing and Logistics has significant implications for the TCR implementation process. Accordingly, we indicate how Ellram's"8 procedure should be modified to properly address logistics outsourcing issues.

Step 1–Determine desired benefits of TCR

Recent empirical results indicate logistics outsourcing is considered either for cost savings or for strategic reasons.29 TCR analysis must allow for benefits that can be difficult to quantify. For example, under components outsourcing, purchasing can often point to inventory cost reductions as a result of better service. Similar benefits accrue if the third party can deliver every day vs. the private fleet's once per week. However, the cost decreases may be shared with your customer, who in theory will then buy more. A true TCR analysis will take into account both internal cost savings vs. third-party charges and external sales growth (or decrease). The latter quantity would probably have to be negotiated and agreed to with the marketing department.

Step 2–Determine the functions or processes to analyze

Logistics outsourcing is often done on a function by function basis.' Although total logistics outsourcing is possible, it is relatively rare.3' Thus, it may be appropriate to identify particular logistics functions for initial analysis. One can prioritize functions based first on the availability of capable, compatible suppliers. It is important to recognize that TCO studies have established that the culture of the organizations–buyer and supplier–must be amenable to the in-depth analysis envisioned by this methodology.32 For logistics, the customer's culture must also be considered in selecting functions to outsource. If your customers place great value on specific personal relationships, then you should either avoid outsourcing the functions involved or work with the third party to guarantee these people's transfer to the third party. If your customers simply want the lowest delivered price, then outsourcing should start with the function which will generate the most cost savings. In the latter case, it is appropriate to work directly with customers to include all order fulfillment costs before and after outsourcing. If the customers will not share data, then outsourcing should start with functions which are least affected by customer requirements, such as replenishment transportation or warehousing in support of internal functions.

Step 3–Choose standard model, unique model, or a mix of both Logistics outsourcing is a make-buy decision that can have major consequences for a company's customer relationships. Therefore, choosing the appropriate TCR

model, standard, unique, or mixed, is essential. Standard models consider a predetermined set of cost issues. Standard models are most appropriate for repetitive situations, where the same considerations recur and can be dealt with in a preset approach. Unique models are developed to specifically fit a particular decision scenario.3 Thus, the choice of standard vs. unique is a function of how important situation-specific factors are in the final decision. In all cases, the model will have to include costs for ongoing tracking of both external interfaces–buyer to supplier and supplier to customer. Whether it makes sense to apply the model across multiple functions and customers depends on the nature of the company's market. Large expenditures and customers probably merit the development of a unique, function-specific model, and the model may even have to be

specialized by customer. For example, if a particular customer demands nonstandard package sizes, extremely tight EDI linkages, and specific delivery procedures, the model for that customer will include elements and details which will not apply to any other customer. This is the case for those who service large retailers. Kmart, for example, may require a separate label on every case on every pallet to facilitate crossdocking at its distribution centers. Most manufacturing warehouses are not equipped to handle such a requirement. Should the huge Kmart business be serviced through a third party? Those analyzing the decision will probably have to develop a unique TCR model to address the question.
Many small and medium-sized customers will accept standard packs, order by telephone or EDI, and live with manufacturer's suggested lead times. One standard model may be adequate to support a blanket decision on logistics outsourcing for these smaller customers. For example, L'eggs division of Sara Lee had a system of representatives who stocked all the instore displays, kept inventory, etc. A Total Cost of Relationship analysis for this channel could not practically single out specific representatives or routes. Route profitability could best be calculated using a standard model, possibly incorporating some provision for differing travel times, mall vs. free-standing store, average size of establishment, and other relevant factors.

(Table Omitted)

Captioned as: TABLE 3

The more a company implements tailored logistics,34 the less likely it is that a single standard TCR model will be suitable for logistics outsourcing. The need for such individualized attention is usually dictated by supplier and customer strength in the market place and the importance of the specific account. The availability of custom services is another issue. Many third parties will consider helping Procter and Gamble serve Walmart, and these suppliers may have different cost structures and capabilities. In that case, Procter and Gamble will almost certainly need a unique model both for its own (make) analysis and for the provider (buy) analysis. But suppose a Phelps Dodge mine has only one railroad serving the location. Although a TCR analysis may be helpful in understanding the real costs of using the railroad, the time consuming development of a unique model is not warranted because there are no realistic alternatives.

Step 4-Choose between a cost-based and a value-based model

Certain costs associated with outsourcing are easily quantified-hardware, software, etc. Cost-based TCO models explicitly include only those items that can be quantified, while value-based models also consider some soft costs. As we have argued above, most logistics decisions will require a value-based model. On the other hand, a cost- or dollarbased approach "gives the appearance of greater objectivity."35 One approach to this dilemma is to bring marketing into the decision process early, so that they can explicitly decide how to project costs and benefits relative to key customers. For example, one of the key findings of most outsourcing research is that loss of control is the major impediment to third-party

use.36 How can one estimate the cost of loss of control? Perhaps marketing could project how much revenue will be lost if a third party handles customer service. Or operations might estimate how plant shipping costs will go up if a third party receives and schedules customer orders.

Step 5–Form a team to work on the project

Research in logistics outsourcing has identified a certain set of functions which are usually involved in the outsourcing decision. Besides logistics personnel, representatives from finance, information systems, and manufacturing are typically involved.37 However, purchasing is usually not in this group. If purchasing has prior experience with

TCO, it should probably be included as a consultant or facilitator. Data requirements will almost certainly mandate either an information systems member or liaison. Customer representation should also be considered at appropriate stages of the analysis. Here again the external orientation of logistics is crucial. Companies set their own specifications for the components they use, but customers determine the requirements logistics must meet. Any outsourcing decision should consider future needs, because reinstituting an internal function can be difficult and expensive. Some supplier participation in TCR analysis may also be helpful, analogous to early supplier involvement in manufacturing decisions. Both RJR Nabisco and The Gap have reported problems with third parties who apparently did not understand their requirements.38 Early involvement of knowledgeable suppliers is a valuable "reality check" on the team's expectations of the third-party marketplace.

Step 6–Test TCR benefits and modeling approach

Certain logistics functions are frequently outsourced. These include freight payment, customs brokerage, and international freight forwarding. The TCR process should be applied to these activities first. If outsourcing is not indicated, the model's cost assumptions, supporting cost data, and approach should be rechecked. These target functions always involve a high degree of specialized knowledge and expensive systems support. In addition, the competition in the supplier market is often intense. A priori, one would expect a valid TCR model to indicate that in-house functions are more expensive than third parties, unless there is tremendous transaction volume. Evaluating these commonly outsourced functions is an easy way to check whether the relevant functions have been considered in the TCR model.

If marketing has not been consulted before, this is also the time to involve the customer relations and salespeople. Special emphasis should be placed on checking and rechecking interface costs and soft management/overhead estimates. For example, suppose the question is whether to outsource customs brokerage. Will the outsourcing eliminate the need to find carriers overseas? Will the use of an outside broker put off some customers? In Mexico, buyers expect to specify the broker, and the

broker specifies the carrier. Studies should be performed to see how long border delays are likely to be. Marketing should then contact customers to introduce the possibility of third-party brokers and test the effects of longer transit times.

Step 7-Fine tune the TCR analysis approach

Armed with feedback from the previous stage (Step 6), logistics personnel can refine the analysis by laying out the "real-world" complications. Customer service, marketing involvement, and interorganizational data linkages will be key issues in this stage. Responsibility for ongoing maintenance and monitoring of the TCR analysis approach will also have to be assigned. Ideally, the TCR process should allow easy consideration of various outsourcing alternatives, from separate providers for warehousing, transportation, etc. to "one-stop shopping" with integrated third-party logistics companies. This is the stage at which standards for the relationships, if any, should be set. Are one-year contracts the norm? Five-year? Is electronic data interchange (EDI) a critical supplier capability? These kinds of issues are important to the total cost analysis, and may in turn affect the analytical approach as well as the final recommendations. As Ellram (1994) points out, recommendations for timetables, education, etc., all should be finalized during this period.

Step 8-Present recommendations and implement

The focus of TCR in the logistics area, and on outsourcing in particular, may dictate a different top management group for the program sell vs. the component make/buy situation. Key Marketing personnel and customer interface people will have to buy in to the approach, and accept any outsourcing recommendations at this stage, so their early participation in the project is crucial. Unlike the component outsourcing decision, customers will notice if company interface personnel are replaced by third parties. To deal with this reality, the TCR model will have to carry credibility below top management, and extensive education of customer contact people is appropriate. We would also recommend presenting TCR findings to important customers. Larger customers will be particularly concerned about any changes in their supply lines, and they are most likely to go directly to top management if an outsourcing project has startup problems. On the other hand, large customers may be impressed if the firm can demonstrate a state of the art approach to supply chain management issues. Prepositioned customers may be very helpful in gaining marketing's support for future TCR initiatives.

Step 9-Continuous improvement

Refining the outsourcing evaluation process is important, especially when the decision is made to keep a function in-house where it will receive continuing scrutiny. Costs and service capabilities of providers and internal personnel should be evaluated on a regular basis and trade-off assumptions revisited (as with any make-or-buy situation). Supplier markets

continue to evolve, and organizational forms, systems capabilities, and

service standards are being upgraded. Integrated logistics providers appear to be growing rapidly and are being held up as models of customer satisfaction.' Long haul LTL carriers are instituting two-day service lanes, where before three or four days were the norm. Warehousing experts wonder how much postponement can be built into the supply chain, and where the finishing operation should take place.40 Federal Express now advertises "worldwide inventory visibility."41

Keeping the TCR process up to date requires systematic data gathering in three areas:

1) Market expectations and standards should be constantly reevaluated for two reasons. First, TCR analysis should indicate whether to support new markets and products internally or with third parties. Second, customers may demand new services such as Vendor Managed Inventory, and a TCR analysis will have to be performed for the new service.

2) Conditions within the company may change. Outsourcing is often the result of such trigger events as management changes, reengineering, or more stringent financial goals.42 A well thought out TCR process can lead to realistic expectations as outsourcing (or the reversal of outsourcing) is instituted.

3) The provider marketplace may change as new technologies or logistics service companies emerge. A typical example was noted above. U.S. trucking companies are now achieving faster transit times in selected origin/destination markets. As a result, many companies are curtailing the use of third party warehouses for customer shipment. Direct plant shipments can now get to destination quickly enough to satisfy customers, thanks to a combination of faster transportation and better customer/shipper communication links. In this case, TCR can aid in 1) deciding which warehouses to close, and 2) evaluating third-party operation of the plant warehouse.

Step 10-Expand TCR concepts to supply chain

Logistics personnel are in an excellent position to work with both suppliers and customers to ensure the lowest total cost for the supply chain. Sharing of operational savings is a well documented practice.43 Customers are also accustomed to working closely with suppliers to optimize delivery costs through practices like vendor-managed inventory, just-in-time, quick response, and so on. Introducing careful, complete cost analysis should be a natural adjunct to efforts to reduce pipeline inventory and improve product availability while reducing logistics costs. TCR can be particularly helpful because it focuses on external supplier and customer issues, and because it is designed to involve Marketing personnel who are typically not part of operational decisions.

TCR may also allow for consistent analysis of key cost drivers. For example, inventory is likely to be an issue at every level of the supply chain. It makes sense to isolate certain costs which are common across all inventories (e.g., cost/square foot by facility, financial opportunity

cost) and then investigate only the costs which will change by function or channel. In the case of inventory, handling costs are likely to be different based on the characteristics of the product and the customer, while communication/tracking costs may differ for a company manufacturing facility vs. a third-party warehouse.

IMPLICATIONS FOR LOGISTICS OUTSOURCING DECISIONS

We have proposed Total Cost of Relationship, an extension of the Total Cost of Ownership methodology, as a useful approach to analyzing the logistics outsourcing decision. Like many costing techniques, TCO was first developed in the manufacturing context, especially for evaluating important purchasing and supply tasks. We believe that TCO can be adapted to logistics issues by incorporating analyses of the external customer and supplier interfaces. In addition, the external focus of TCR implies greater involvement of marketing, customer, and supplier organizations so that all the parties understand the foundations of the various perform/purchase decisions facing logistics managers. Logistics has always considered itself a boundary-spanning discipline. The importance of relationships both within and among firms is explicitly recognized in the expanded framework we have proposed. TCR should enable logistics managers to include customer service issues and supplier capabilities directly in the outsourcing analysis. Logistics managers have always used some third parties, especially in the transportation function. TCR recognizes that using third parties has costs and benefits beyond the rate on the freight bill or even the cost of paying the freight bill.

TCR, if properly applied, will address the concerns of all the current members and potential members of the supply chain. Marketing can estimate a value to the firm for taking its own customer orders vs. a fulfillment house answering the telephone. Logistics can include the cost of increasing the number of customer surveys if private fleet drivers no longer talk to customers. Manufacturing can attempt to estimate the benefit of freeing up resources now devoted to making up special packs for mass merchandisers. Information systems will have input on the cost of upgrading communications with logistics suppliers and customers if third parties replace employees in taking orders or collecting delivery receipts.

We have emphasized throughout this paper that contracting for logistics services is different than contracting for parts, and therefore requires different tools to support decision-making. The differences we have identified are inherent to the two processes. Logistics is primarily focused on external customers, while purchasing works primarily to satisfy internal users. Logistics is all about services, while much of purchasing's job pertains to tangible goods and products. Logistics has to react to customer requests, while purchasing can define supplier requirements. Logistics must satisfy externally-generated demand for product, but purchasing can work with internally generated production schedules. Finally, logistics often coordinates all stages of the distribution process, while purchasing may participate directly in only one or two stages of the supply process.

The Total Cost of Relationship procedure, which is generalized from purchasing's Total Cost of Ownership methodology, provides a comprehensive framework from which to address supply chain relationship decisions. Many of the customer service and supplier capability issues cannot be reduced to exact dollar impacts, but a complete TCR analysis should lead to an orderly, credible decision framework for the logistics outsourcing decisions that are becoming routine for U.S. manufacturers.

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THIS IS THE FULL-TEXT.

Descriptors: Logistics; Outsourcing; Decision making; Customer satisfaction; Studies
Classification Codes: 9130 (CN=Experimental/Theoretical); 5160 (CN=Transportation); 2400 (CN=Public relations)
Text:

In principle, the issue of whether to outsource such logistics functions as transportation, warehousing, and order processing is a variation on the traditional...

...core competencies are involved.5

A number of companies have used Total Cost of Ownership (TCO) procedures to incorporate nonprice considerations into the make/buy decision.6 We believe that TCO is an excellent starting point for analyzing logistics outsourcing issues. However logistics, especially finished goods...logistics third parties must manage at least two external relationships. If distribution functions are being outsourced, the relevant dyads are logistics buyer/logistics supplier and logistics supplier/final customer. If materials...

...the key interfaces are buyer/logistics supplier and logistics supplier/material supplier. The product-oriented TCO framework must be expanded to include the relationship costs associated with these interfaces. The literature...

...relationship costs and logistics supplier/final customer relationship costs.

Logistics buyer/logistics supplier interface costs

Ellram and Siferd9 detailed the activities purchasing performs to acquire goods. They suggested six general drivers...be included in Total Cost of Relationship calculations.

Logistics Supplier/Final Customer Interface Costs

Unlike TCO, TCR makes explicit provision for monitoring an interface where no company employees participate–the logistics...

...itself as a provider of customer service,21 although cost control is important.22 Standard TCO procedures, which emphasize concerns such as "renewals, replacements, general maintenance..."23 must be modified to ...

...above, quantifying the benefits and risks of customer service remains uncharted territory. For purchasing managers, TCO is a helpful framework for better evaluating the key decision criterion, cost, in component make...product procurement decisions. The next section of this paper lays the conceptual foundation for changing TCO to make it specifically applicable to logistics services outsourcing decisions.

APPLYING TCO/TCR TO THE LOGISTICS OUTSOURCING DECISION

Ellram26 outlines a "10-Step Approach to Implementing TCO Analysis." This section adapts the 10-step approach to the specific issue of outsourcing logistics...

...order to delivery shipment visibility, and function as the last stage in product marketing. As Ellram notes,27 purchasing has frequently been the driver in applying TCO methodology to operational, tactical, and strategic decisions. The difference in functional leadership and orientation between Purchasing and Logistics has significant implications for the TCR implementation process. Accordingly, we indicate how Ellram's"8 procedure should be modified to properly address logistics outsourcing issues.

Step 1–Determine...

...based first on the availability of capable, compatible suppliers. It is important to recognize that TCO studies have established that the culture of the organizations–buyer and supplier–must be amenable...

...32 For logistics, the customer's culture must also be considered in selecting functions to outsource. If your customers place great value on specific personal relationships, then you should either avoid... based model

Certain costs associated with outsourcing are easily quantified–hardware, software, etc. Cost-based TCO models explicitly include only those items that can be quantified, while value-based models also...

...37 However, purchasing is usually not in this group. If purchasing has prior experience with

TCO, it should probably be included as a consultant or facilitator. Data requirements will almost certainly...

...party marketplace.

Step 6–Test TCR benefits and modeling approach

Certain logistics functions are frequently outsourced. These include freight payment, customs brokerage, and international freight forwarding. The TCR process should be...

...are more expensive than third parties, unless there is tremendous transaction volume. Evaluating these commonly outsourced functions is an easy way to check whether the relevant functions have been considered in...

...interface costs and soft management/overhead estimates. For example, suppose the question is whether to outsource customs brokerage. Will the outsourcing eliminate the need to find carriers overseas? Will the use ...

...and may in turn affect the analytical approach as well as the final recommendations. As Ellram (1994) points out, recommendations for timetables, education, etc., all should be finalized during this period... methodology, as a useful approach to analyzing the logistics outsourcing decision. Like many costing techniques, TCO was first developed in the manufacturing context, especially for evaluating important purchasing and supply tasks. We believe that TCO can be adapted to logistics issues by incorporating analyses of the external customer and supplier... Frederick G. Hilmer, "Strategic Outsourcing," Sloan Management Review 35 (Summer, 1994): 43–55.

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A PRACTITIONER'S DECISION MODEL FOR THE TOTAL COST OF OUTSOURCING AND APPLICATION TO CHINA, MEXICO, AND THE UNITED STATES

Kumar, Sameer; Kopitzke, Kristoffer K
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Abstract:

Outsourcing of manufacturing to Mexico and China includes costs that are not always considered and benefits that are not always correctly quantified. An analytical model for determining outsourcing costs was developed and results from that model are presented. Using that model, the sensitivity of outsourcing costs to several variables was modeled and analyzed. Guidance is provided regarding factors to consider in an outsourcing decision. (PUBLICATION ABSTRACT)

Text:

INTRODUCTION
Outsourcing of operations abroad has become so commonplace as to be taken for a standard of doing business. In the past year, almost 1600 newspaper articles have been published with "outsourcing" in the headline. Wal-Mart alone brings in over $15 billion in goods from China in 2003, while its American suppliers provided goods that were partially or wholly manufactured in China (Hua 2004). Software houses look to outsource support and coding to India and China, and more firms are outsourcing non-core processes to firms outside of their firm or outside of the country.

But are these firms considering the total operations cost of outsourcing? While certainly there are labor-intensive, low-margin, high-volume products where outsourcing is economical, there are also costs associated with outsourcing that are not always considered. This paper will examine those costs, looking particularly at the costs of outsourcing manufacturing from the United States to Mexico and China. Shipping costs, inventory costs, exchange rates, tariffs and taxes must all be considered as tangible costs to outsourcing; intangible costs must be considered as well: political and economic risks, management and control costs, and a loss of the ability to implement truly lean manufacturing processes throughout the supply chain.

This paper seeks to answer the following questions about the outsourcing decision as it applies to a manufacturing concern:

* What are the quantifiable savings of outsourcing?

* What factors of the outsourcing decision increase the total cost of operations?

* How do these factors affect the decision to outsource operations to Mexico and China?

Perhaps most importantly for an operations manager, when does it make economic sense for a company:

* To outsource operations to China?

* To outsource operations in Mexico?

* To mix operations in both Mexico and China?

* To sustain or grow operations domestically instead?

To familiarize operations managers looking at outsourcing, the first section provides an overview of outsourcing and quantifies the labor cost savings that can be realized. We then examine some of the other benefits and the costs of outsourcing specific to Mexico. Following this we examine the benefits and costs of outsourcing operations specific to China. We then describe an analytical model developed using Microsoft Excel and an inexpensive statistical software package, demonstrating how the practicing manager can develop a thorough decision model. Examples of the model and its use in the examination of an outsourcing decision are presented. In this section the sensitivity of the outsourcing decision to several key factors is also examined. Next, based on experience developing and working with the model, we provide recommendations and guidance for the practitioner making an outsourcing decision to either Mexico or China. Finally, a number of directions for future research are presented.

This study and the associated model necessarily had to be bound in scope, though the lessons learned could certainly be applied to nations other than Mexico and China. Mexico and China were chosen in part to look at the forces that turned post-NAFTA exuberance for Mexico into an explosion in

overseas manufacturing. These two countries remain the most significant destinations for the outsourcing of American manufacturing and are among our largest trading partners. For all these reasons, examining only China and Mexico was a sensible and informative restriction. However, the impact of other offshoring destinations can be studied by expanding the model to consider the growing number of nations who are part of the outsourcing phenomena.

TRENDS IN OUTSOURCING

Outsourcing has been a major movement across many industries in recent years and is often viewed as a way to find a supplier who can help in the reduction of labor costs. Beyond the reduction of labor costs, the dynamics of when and how outsourcing can be effective is less well understood. In an effort to better develop a simple and effective decision model, the authors examined the major drivers for outsourcing by focusing on the decision to manufacture in China, Mexico or within the USA.

While outsourcing can provide economic benefits, the decision to do so can be contentious and wrapped in politics. Labor cost reductions in other markets, especially in Asia when offshoring, can be significant (La Londe 2004, p. 6). Resistance to outsourcing in America has stemmed from the transfer of jobs out of the country, which has been seen by some as an exploitation of poorer nations (Eisenbeis 2006). The real impact on the American economy, however, is not well defined. Less than 11% of Americans today are employed in manufacturing, and over 3.3 million service jobs will also be moved to low-cost countries by 2015 (Farrell 2004, p. 84). From the business manager's perspective, foreign contractors can provide significant time-to-market capabilities, which might outweigh a higher wholesale cost. These economics only work if the contractor has the process technologies and capacity in place to meet time-dependant product introduction windows (Ulku, Toktay and Yucesan 2005). Outsourcing can give organizations access to capacity, capability, skills and technologies that they do not want to invest in themselves. This, in turn, enables them to free-up resources and capital for other purposes and to focus on key differentiators, their core competencies (Hogan 2004, p. 12; Kim 2003), while leveraging the economies of scale of their outsource suppliers. By reducing risk and debt, the organization gains in flexibility (Fisher 2004, p. 13). The growth in the use of Internet, e-commerce and information technologies have made these technologies more accessible to small manufacturers. In this new virtual manufacturing environment, small manufacturers can have many of the benefits of a large manufacturing enterprise without the capital investment in equipment and personnel, enabling small manufacturers to play in markets only large players could in the past (Offodile and Abdel-Malek 2002, p. 15 1).

The risk to manufacturers is in overrating the value of wage savings and underestimating the inventory, obsolescence, intellectual property and currency risks associated with outsourcing. Manufacturers must also be wary of the logistical risks incurred when the new supplier is further from current customers than existing in-house capabilities (Hogan 2004, p. 12).

Total Cost of Ownership Considerations

Total cost of ownership (TCO) is a process of analyzing supply chain activities and their associated costs with a particular supplier for a particular good or service. Ellram and Sieferd (1993) proposed TCO, but the general concept has been around prior to 1993 under a number of different names: total cost (Cavinato 1991, 1992), life cycle costing (Jackson and Ostrom 1980), cost-based supplier performance evaluation system (Monczka and Trecha 1988), cost of ownership (Carr and Ittner 1992), zero base pricing (Burt, Norquist, and Anklesaria 1990), and product life cycle costs (Shields and Young 1991). All of these concepts are structured around three basic supporting ideas: that cost must be examined from a long-term perspective beyond just the initial price; that Purchasing must consider the effects of other business functions on the value of a specific purchase; and that Purchasing must understand the cost impacts of all Purchasing activities (Ferrin and Plank 2002). TCO is relevant not only for the firm that wants to reduce its cost of doing business, but also for the firm that aims to design products or services that provide the lowest total cost of ownership to end customers.

Some typical ownership costs include those associated with processing inventory (direct materials), repair, maintenance, warranty, training, operating, inventory carrying, contract administration, and downtime cost for operating equipment. Post-ownership costs may include those of disposal and environmental cleanup. The addition of risk and its associated costs adds yet another dimension. These costs and others must be estimated and included in a total cost analysis.

A business enterprise can apply the practice of TCO to the strategic optimization of costs within the supply chain network. For example, a manufacturer in the USA has the option of:

a) making a new product in China (potentially lower manufacturing costs) and shipping it to their customer base in the United States (higher transportation costs); or

b) manufacturing it in Mexico (little higher manufacturing costs than China and lower transportation costs); or

c) manufacturing it in the United States (potentially higher manufacturing costs) with minimal shipping (lower transportation costs).

The manufacturer will have to determine the total cost of each alternative before making a decision. The

TCO analysis should include the study of such factors as:

* The manufacturability of the product (value engineering / value analysis).

* The manufacturing infrastructure requirements (the basic facilities, services, and installations needed for the optimal functioning of the manufacturing operation).

* The structure of foreign and domestic tariffs/duties/taxes.
* The costs of transportation and the timeliness of delivery.

* Foreign business/labor/environmental regulations.

* Foreign political/economic stability.

* Foreign currency exchange risk.

* Language/communications requirements.

* Volatility of end-customer demand and the responsiveness of the network to changes in that demand.

* Inventory carrying costs (investment versus service levels).

* Inventory risk (relocation, damage, obsolescence, shrinkage).

* Quality costs.

Although much of this analysis is ultimately quantifiable in dollars, some elements will require a qualitative evaluation offering less certainty.

MEXICO AND CHINA COMPARED AS OUTSOURCING OPTIONS
Scope of Production in China and Mexico

Both China and Mexico are approaching the level of imports delivered from Canada, the United States' top trading partner. China currently has about 3 percent of the US industrial goods business, but the shipments from China to the United States have been growing at a 21 percent annual rate in a period of essential flat economic demand (Hout and Lebreton 2003).

The North American Free Trade Agreement (NAFTA) opened up the Mexican manufacturing market to the United States in the early 1990's. In the late 1990's economic reforms in China allowed provincial governors to manage their state's economies with little interference from the central government (Ohmae 2005, p. 99). The result has been the rapid growth of China's coastal manufacturing areas and a drawdown of manufacturing in other low-labor-rate nations. According to the Mexican government, 500 of the nation's 3700 maquiladoras1 have closed since 2001 eliminating 218,000 jobs in the process (Forero 2003).

Labor Rates

China's clearest advantage over the industrialized world is low labor rates. In the absence of automation, the cost of labor can represent a significant portion of a product's manufacturing cost. While a finished

equipment manufacturer's payroll may represent 10% of costs, the total labor costs, including subcomponents, can be as much as 40% to 60% of the products final cost (Hout and Lebreton 2003). In the garment industry, labor costs represent about 33% of the final cost for production in the United States (US International Trade Commission (USITC) 1985). When the Milwaukee Tool company manufacturers a drill in the United States, about 33% of the cost is due to labor (Dewhurst and Meeker 2004). Clearly a significant savings in the cost of labor can have an impact on the total cost of production for some products. Labor rates in China are not only significantly lower than those in the United States, but in many cases lower than those available in Mexico. Manual labor costs can be as low as $50-$60 per month; engineering costs can be reduced to as low as $500 per month (Ting 2004).

The literature on actual labor rates in China presents a variety of possible rates. Though Chinese labor rates vary by region, a production worker can cost as little as 5% of the cost of an American production worker, and engineers and plant managers can cost about 35% of their American counterparts (Hout and Lebreton 2003). The consensus appears to be that the low end of the labor rate is around $0.50 per hour (Purdam 2004), though some sources put the cost as low as $0.33 per hour. As Meeker and Dewhurst note regarding production labor: "Expecting a labor rate at $0.33 could be quite unrealistic. Establishing a first manufacturing venture may require the use of a Chinese broker, who charges overhead onto the labor rate. The labor rate can be as high as $5.10 /hour for the firsttime manufacturer" (Dewhurst and Meeker 2004). As China's economic base matures average wage rates can be expected to increase; any analysis of the outsourcing decision needs to consider variability in these labor rates over time.

To make the most of the abundance of inexpensive labor, Chinese businesses are challenging the western mantra of productivity through increased automation. For decades, high-cost labor economies Japan and the United States have stressed quality improvement and embraced automation as a means for eliminating waste and reducing total labor costs. Chinese manufacturing concerns have taken a different approach that leverages low labor rates, reducing automation and the associated capital costs of the manufacturing process as compared to the traditional manufacturing economies. Greater focus is given to parts designed to be assembled by hand and the complexity of plant processes are thus reduced. Some Chinese factories have leveraged this into a great flexibility to change production lines and to reduce the time from design to production. Output per worker is significantly lower, but because of the decreased capital costs and low wages, the return on capital investment is higher than at US factories (Hout and Lebreton 2003). Particularly disconcerting for United States workers, these production methods cannot be adapted by the United States in the way that Japanese quality initiatives were adapted.

In Mexico, labor rates can be established with a less variability than in China. In general, rates can be expected to be between $2.00 and $2.50 an hour (Michelini 2003). Mexico has a minimum wage of about $0.65 per hour, though factory workers generally enjoy higher than minimum pay (Barr 1994).

Mexico also imposes certain obligations on the company, such as mandatory pension funding and severance packages that drive up the actual cost of labor. The lower labor rates in China drew away manufacturing from Mexico, but some manufacturers that moved from Mexico to China have found that higher costs in management and logistics outweigh the benefits of cheaper labor (Jorgensen 2004).

Operations in Mexico incur some costs to outsourcing in the form of government mandated benefits. These benefits can cost a firm an additional 60-80% on top of labor costs, compared with an average of about 37% in the United States (Barr 1994). Some of these benefits and their costs are:

* Basic Medical 8.75% up to 25 times minimum wage

* Social Security 5.81% up to 10 times minimum wage

* Seniority Severance 12 days pay per year of service after 15 years

* Involuntary Severance 3 months plus 20 days pay per year of service

* Savings Plan 2% up to 25 times minimum wage
* Profit Sharing 10% of pretax profits

Mexican labor rates are unlikely to ever drop to China's level, as Mexican Economy Secretary Fernando Canales said in 2003 , his country "does not want to be a country with cheap labor, or ones as expensive as in the United States, Canada, Europe or Japan, either. We are determined to get better and more pay for Mexican labor" (EFE 2003).

Cost of Quality

The Mexican and Chinese labor pools have an unearned reputation for being less skilled than their American counterparts; many companies are pleased with the skill of laborers in Mexico. For example, the Smith West Corporation, a precision aerospace mechanical device manufacturer in Tempe, Arizona, expanded its business operations into Sonora, Mexico. Smith West had planned to use the Mexican facility only for rough work, with the product's finishing work being conducted in Tempe. The quality of the work being done in Sonora was such that Smith West now ships finished goods directly to the customer from Mexico (Purdam 2004). Though worker productivity in the United States is generally accepted as being among the world's highest, a significantly lower labor rate can provide substantial savings even at a lower level of worker productivity.

Moving operations to China and shifting towards a less automation-oriented manufacturing system will lead to a less consistent product with inherently lower quality. For cutting edge technology, Mexican workers have an edge over their Chinese counterparts in job skills, training, and experience (Atkinson 2003). Even for low-tech manufacturing, quality can be an issue. Manufacturers of small engines and farm equipment have looked into outsourcing work in China. Analysis of the unreliable supply lines back to the United States and uneven quality led them to the conclusion that the

increased technical and inventory support costs would outweigh the benefits of cheaper labor (Hout and Lebreton 2003).

Location and Setup Support Costs

Mexico enjoys a tremendous advantage over China in terms of location. A flight from Chicago to Mexico is not much longer than flights to most locations in the United States, allowing for shorter trips. Mexico also shares time zones with the United States, meaning that coordination can be handled more easily during normal business hours. The resulting lead time for putting additional product into the supply chain presents another significant advantage. Product can be delivered from most locations in Mexico within 4-5 days via truck. As a result, a Mexican manufacturing facility can react to changes in demand much quicker than their Chinese counterparts.

Managing operations with a manufacturing firm half way around the world in China introduces different set of costs. A flight from Chicago will take 19 hours to reach China, making a short trip impractical. Manufacturing facilities in Mexico can be reached in only 4 hours, making productive Monday to Friday trips quite feasible (Michelini 2003). Advances in telecommunications have lessened the need to travel, but China is 10 to 14 hours ahead of most of the United States. As a result, operations in the United States and in China have very little overlap in working hours. This complicates coordination and leads to delays in executing changes or answering questions on both ends. Management traveling to operations in China will also have to contend with travel fatigue and language barriers. Though English speakers can be found at large factories, smaller manufacturers often lack expertise in speaking English (Michelini 2003). This further complicates management and communications.

Manufacturing setup costs in Mexico tend to be less expensive than costs in China and less dependent on developing personal relationships. Mexico utilizes a system of "pre-fabricated" companies, which are designed to provide the facility and labor (including experienced legal, accounting, finance, customs, shipping and purchasing personnel) for a manufacturing facility. Establishing a similar facility in China will also incur start-up costs of $1 million or more and can take up to a year to bring to fruition. In Mexico, a similar capability can be established through a local company in as little as three months (Michelini 2003).

Shipping Costs

Manufacturing products in China creates a longer supply chain and increases shipping costs compared to similar production in Mexico. Moving a product or components from a factory in China can be costly even without assessing the inventory costs. One estimate for the cost of shipping a container from China to the United States is about $2,600. The cost of transporting material from the factory to the port is estimated to double that amount on a per container basis (Dewhurst and Meeker 2004). Another estimate for shipping costs puts the cost for consolidated ocean freight at $0.75 per

pound (Michelini 2003). If we assume a productized drill weighs 8.5 pounds, the cost for a container is much higher, $14,400 or over 6% of the cost per unit. Depending on the productivity of the workers, the shipping costs alone may be more than the expected savings from outsourcing. For light, labor-intensive products, air freight can sometimes prove more cost effective than ocean freight, particularly when inventory carrying costs are considered. With a good consolidator, air freight from China can cost as little as $1.50 per pound (Michelini 2003), making air freight competitive with trucking rates from Mexico. For most large production runs and products, however, the sporadic availability of low-cost consolidated shipping simply isn't a reliable option.

The options can be contrasted with the costs of shipping from Mexico, which tend to be lower. The cost of trucking from Mexico runs around $1.50 per pound, though small loads can reach $3.00 per pound (Michelini 2003). Low per pound shipping costs from Mexico are also attractive due to its proximity to the United States, particularly for large items. Shigeharu Tsuchitani, chairman of JVC Americas, has kept manufacturing large screen televisions in Mexico, stating: "Americans prefer large screen TVs, and the higher freight costs of shipping large TVs from China, for example, outstrip any manufacturing cost savings"(Purdam 2004).

Additional Inventory Costs

Goods in transit represent inventory that has a cost associated with it. Shipping times from China can be 6 to 8 weeks, and during that time, insurance and breakage (part of inventory carrying costs) are being incurred. For a cargo container of a consumer product worth $100/unit and with a carrying cost of 30% per year, a container of product would incur costs of $9,100 or 4% of the product cost. Other inventory costs are more difficult to quantify, but certainly impact operations. The long lead time for products from China means more inventory must be maintained in the United States to support a longer lead time. For example, if the demand for a product is 100 units per day, carrying costs of a container could be $20,000 more than if the product could be delivered with only 5 days lead time. Out-of-stock costs and lost sales should also be considered closely, particularly since acquiring replacements for flawed products can add significant amounts of time to the supply chain. For industries practicing lean manufacturing, these delays can disrupt the system and offset the gains made from lower labor costs. In contrast, Mexico's proximity to American markets allows Mexican manufacturing to respond faster and therefore reduce carrying costs.

Politics

Mexico offers several political advantages that provide a solid business environment. Mexico has a more stable political environment than many Latin American nations and a government that has developed its economy along lines compatible with American business practices. Mexico's democratic government also provides a transparent decision-making system leaving businesses operating in Mexico less likely to be caught unawares by unilateral decisions made out of public view.

Mexico's most attractive political asset is the free trade agreements it has in place. In addition to the North American Free Trade Agreement (NAFTA), Mexico has free trade agreements with Japan and the European Union. The maquiladoras system also provides a strong incentive for

producing goods destined for foreign consumption with Mexican labor.

China's government has also created a solid business environment in recent years through shrewd government guidance and a willingness to invest huge amounts of the nation's capital into infrastructure. Regional governors and city mayors were given increasing levels of autonomy in the 1990's. Those who brought business into China were rewarded with promotions within the government, where they were able to implement successful policies on a larger scale. Much like a successful company, the government has promoted personnel who bring in business. China's government has also played the part of a financier, creating an infrastructure for manufacturing and business, often turning rice paddies into bustling cities within only a few years. One example is just outside of Shanghai: "Fifteen years ago, Pudong, in east Shanghai, was undeveloped countryside. Today it is Shanghai's financial district, eight times the size of London's new financial district, Canary Wharf, in fact only slightly smaller than the city of Chicago" (Zakaria et al. 2005).

Currency Exchange Risks

Currency fluctuations can create a hedging risk and cost that must be borne as well. While the Mexican economy is stable, there has been about a 20% variation in the exchange rate between the Mexican Peso and the US Dollar over the past five years as shown in Figure 1 . This variation in the exchange rate can be managed through hedging, but these activities represent an additional cost to manufacturing in Mexico.

FIGURE 1
EXHANGE RATES - MEXICO

China's government has fixed the exchange rate of their currency, the Chinese Yuan, to the US Dollar rather than letting the exchange rate float on the currency market. Critics claim that this move has effectively subsidized the price of Chinese goods by up to 40 percent (Metal Center News, 2005). The historical exchange rate is shown in Figure 2.

FIGURE 2

HISTORICAL EXCHANGE RATE - CHINA

Recently China changed the rate at which the Yuan was pegged by 2% and announced that it would be allowed to float slightly based on a basket of currencies. Stephen Jen, an economist at Morgan Stanley, has estimated this basket to give the dollar a weight of 43%, the yen 18% and the euro 14%.

(Economist, 2005), but the Yuan is still only allowed to vary by 0.3% each day.

ANALYSIS OF OPTIONS

In order to examine the costs of outsourcing various products, the authors developed a cost model in Microsoft Excel. This model takes into account the cost of labor, the costs of excess inventory, currency fluctuation risks and the costs of shipping inventory. The model utilizes the @Risk software from Palisade Decision Tools to allow for statistical analysis of cost factors. The model has been designed to be flexible enough to assess the costs of production in any country, though here we examine the United States, Mexico, and China. Both Microsoft Excel and @Risk are an inexpensive and accessible means for an operations practitioner to develop a strategic decision-making tool that incorporates uncertainty in knowledge and other risk factors.

For practitioners interested in modeling outsourcing decisions to other countries, a number of on-line and off-line resources are available. Ithaca College's Association for Global Business provides links to a number of international business data sources at http://www.ithaca.edu/agb/research.htm. Detailed information can also be found at the web sites of individual country's economic development agencies. The sites can also be a valuable resource for identifying in-country economic development officers that can help establish appropriate labor rates. Establishing reliable currency and insurance costs can be accomplished by a practitioner contacting their own firm's bank, insurance firm, and/or customs broker. A customs broker can also be an excellent resource for establishing reliable shipping costs and transit times.

In the sample figures and data provided below, the outsourcing of production for a Milwaukee Tools drill has been modeled. In a 2004 paper, "Improved Product Design Practices Would Make US Manufacturing More Cost Effective, a Case to Consider before Outsourcing to China," Nicholas Dewhurst and David Meeker presented the Milwaukee Tools drill as a real world example. Expanding on that data and analysis, we have created a more complex model of the total cost of outsourcing that remains consistent with their results. The model can also be readily tailored to address the specific attributes of other products and operations cost structures.

Model Inputs

The model has been designed to use as few inputs as necessary. Because every product has different characteristics, a certain amount of tailoring is required for accurate modeling. The key inputs are:

* Productions costs: labor, material, and total product cost

* Additional marginal overhead to support operations in China and Mexico

* Carrying cost of inventory

* Product's physical size and weight

* Product demand per day
* Safety margin to be maintained on inventory

* Cost of lower quality as a percentage of total product cost

Figure 3 shows the screen where the user inputs this data. Values shown are for a Milwaukee Tool Company drill.

FIGURE 3

MODEL INPUT SCREEN

Other parameters do not need to be changed for every product, but are nonetheless parameters that the user may want to change. These are shown in Figure 4 and include:

* Size of a shipping container

* Labor rates in the US, Mexico, and China

* Shipping costs: per container and/or per pound

* Travel Time to China and Mexico

* Expected fluctuations in exchange rates

FIGURE 4

SECONDARY USER INPUTS

The model allows the user to provide for variability in any value they choose. For example, because labor rates in Mexico and China cannot be known exactly, a probability curve is used instead of a fixed value. Figures 5 and 6 show the probability distributions used in this example.

FIGURE 5

LABOR RATES IN MEXICO AS MODELED

As discussed in the Outsourcing section, labor rates in Mexico are generally between, $2.00 and $2.50 an hour, with the possibility of benefits adding considerably to that cost. In this case, that cost has been modeled as a curve that skews left. Rates will never be less than $1.50 on the low end, and there's only a 5% chance that the labor rate will exceed $3.70 per hour. This skew to the left can be represented by a Rayleigh distribution (Papoulis 1984).

FIGURE 6

LABOR RATES IN CHINA AS MODELED

In China, labor rates can vary significantly from as low as $0.50 per hour to as high as $5.10 an hour when broker charges are included. In this case, the cost of labor in China has been modeled conservatively, generally between $0.75 and $1.75 per hour. Rates will never be less than $0.50 on the low end, and there's only a 5% chance that the labor rate will exceed $2.45 per hour. A Rayleigh distribution best approximates those costs.

For labor rates in the United States, a decision maker will most likely wish to use the actual cost of labor without representing it as a random variable. For more general studies or for the academic purposes here, the labor rate should be represented as a random variable. For the examples shown here, the United States labor rate has been represented as a normal distribution with a mean of $17.50 per hour and a standard deviation of $2 per hour.

For purposes of this example, carrying costs has been represented as a normal distribution variable with a mean of 30% and a small standard deviation of 1 % to capture some of the uncertainty in the measurement of carrying costs. The shipping times to Mexico and China are also normally distributed to accommodate for variance in oceanic travel times with standard deviations of 1 day and 1 week respectively. The shipping cost of a container has also been represented as a normal distribution to account for uncertainty in the costs and potential variances between shipping companies. These deviations are not supported by empirical data, but should be adjusted by the modeler to reflect their individual experience.

Model Outputs

The model provides two levels of output on two separate worksheets. One worksheet provides interim calculations in the modeling process, such as the number of units that can fit into a shipping container. Details of the equations used in this model are provided in Appendix B. The primary outputs are contained on another worksheet and are shown in Figure 7. The primary outputs are:

* Production cost per unit for production in the US, Mexico, and China

* Shipping costs from Mexico and China

* Inventory carrying costs for production in Mexico or China

* Additional overhead costs

* Cost of quality for production in Mexico or China

* Total cost savings versus the US for production in Mexico and China

The last of these, the total cost savings, will be positi ve if costs exceed benefits. A negative value indicates that money could be saved by outsourcing. These values are calculated automatically whenever an input is changed. When a probability curve is used as an input, the calculation is

conducted using the mean value of the distribution.

In the example of a Milwaukee Tools Company drill, the model shows $21.19 savings on labor costs for outsourcing to China. These savings are offset by:

* Shipping costs: $5.13 - $9.20 per unit

* Inventory carrying costs: $7.58 per unit (long shipping times require higher buffer inventories in the US)

* Additional overhead costs: $7.02 per unit

* Quality cost of $0.70 per unit

which combine to represent a total outsourcing cost of $1.28 per unit on average. In this case, outsourcing to China would not be advisable. Outsourcing to Mexico, however, would result in a cost savings $10.83 per unit.

Note that while the model does not accommodate every element of the Total Cost of Ownership (TCO), the cost elements of quality, management overhead, shipping costs, and currency risk have been included in the model. Using a simple model such as this one, the operations practitioner has leeway to include or disregard elements of the total cost as they see fit and can also weight and model those values statistically to capture uncertainties in knowledge.

FIGURE 7

OUTPUTS OF THE OUTSOURCING MODEL

Because the inputs and outputs to the model are statistical in nature (not just the mean values shown above), we are able to examine the outputs statistically.

Figure 8 shows the output of the simulation for the total cost of outsourcing to Mexico. On this basis, we can determine that based on the information provided to the model, only a 5% chance exists that the savings will be less than $4.87 per unit. Only a 5% chance exists that the savings will exceed $16.61 per unit.

Figure 9 shows the output of the simulation for the total cost of outsourcing to China. Based on the model, outsourcing to China will cost more than it saves, 75% of the time. There is only a 5% chance that outsourcing production will save more than $1.43 per unit.

FIGURE 8

STATISTICAL OUTPUT OF OUTSOURCING MODEL: MEXICO

FIGURE 9

STATISTICAL OUTPUT OF OUTSOURCING MODEL: CHINA

Model Assumptions

The model makes some assumptions that must be noted. First, the model assumes that all goods are being produced for consumption in the United States. Shipping costs will be different for products being delivered elsewhere in the world. Similarly, the model assumes that transportation costs within the United States are the same whether the product is manufactured in China, Mexico, or the United States. Product demand in the model has been assumed to be constant over time. The labor rates used within the model are assumed to be inclusive, including the total cost of all benefits paid to workers. Finally, the size of a container from China and a truckload of product from Mexico have also been assumed to be identical.

CONCLUSIONS AND RECOMMENDATIONS

Based on our work developing and working with the quantitative outsourcing model, we have been able to draw some conclusions that can guide practitioners contemplating an outsourcing decision. Combinations of product complexity and volume may lend themselves better to manufacturing in the United States, China, or Mexico. The answer to the question of when and where to outsource, depends on many factors. In the rush to pursue cheaper labor rates, many companies fail to consider the total costs associated with outsourcing to China or Mexico (Ritter and Sternfels 2004).

The kind of product being manufactured must of course be considered in an outsourcing decision. Consumer goods have been largely immune to the lower quality of products from China or Mexico. The issue is not quality per se but that the same quality can be acquired from China or Mexico at a lower cost. In most consumer products, the consumer places greater value on lower prices and are willing to sacrifice quality for a lower price, as proven by the success of Wal-Mart. Manufacturers in the United States will continue to be cost effective manufacturers of high quality, highly refined or specialized products, or products that are not easily transportable.

One way of examining the outsourcing decision is to evaluate the decision according to the type of product being produced. Figure 10 details the authors' recommendations for various mixes of components (a measure of product complexity) and the volume being produced. This represents the suitability in general for types of manufacturing, but the best decision also depends on the technology being used, the amount of labor involved in the cost, and the tolerance of operations for delays in the supply chain.

In making a decision to outsource a product, a manufacturer should consider the product components and the volume of component that they wish to produce. China is often an uneconomical choice for products with a high mix of components. The cost of shipping components to a China plant for assembly is only cost effective if a significant amount of the component suppliers are in China. Mexico is a cost-effective location to manufacture medium and low volume products of any component mix. Entry costs are low

and workers are sufficiently skilled to produce complex low volume products. The United States remains the best place to manufacture specialized custom products, which can require a high level of skill and often require intellectual property protections. Any manufacturing that benefits from high levels of automation, particularly continuous flow products should also retain operations in the United States.

FIGURE 10

OUTSOURCING BY KIND OF PRODUCT

Conditions for Outsourcing to China
Not all types of products are suitable for outsourcing to China. In general, products suitable for manufacturing in China will meet the following conditions:

Higher volumes, fewer components

Outsourcing to China is very suitable for products that will be produced in large volumes, but utilize few components. Large production runs make the best use of inexpensive labor and products with few components can be more easily adapted to manual labor. If components aren't already produced locally, in China, the expense (particularly administrative costs) of importing and transporting a large number of components can outweigh the benefits.

Production can be de-automated

Not all products can be produced manually, particularly products where quality tolerances are integral to product performance. A medical device manufacturer, for example, is unlikely to be able to transition to hand-built devices and maintain consistent product quality.

Long lead times can be tolerated

If lean manufacturing practices are integral to operations, outsourcing to China will complicate those processes immensely. The inventory required to support long lead times can counteract the very savings that lean manufacturing provides. Long lead times also wreak havoc on materials management systems that are driven by demand. A manufacturing facility in China places a significant amount of product in the supply chain for 4-8 weeks; the supply chain is thus ill suited to manage changes in demand.

Low technology product

Because of the lack of intellectual property protections, low skill level of workers, and manual nature of production, low technology products are much more suited to production in China than cutting edge technology

products.

Conditions for Outsourcing to Mexico

Mexico offers a savings in labor costs over the United States and has systems in place to bring new products into production quickly. In general, products suitable for manufacturing in Mexico will meet the following conditions:

Bring inexpensive capacity on-line fast

Mexico's system of maquiladoras and prefabricated companies allows a firm entering the Mexican manufacturing market to obtain manufacturing capacity quickly. While not as inexpensive as China, the time to market can be as much as nine months faster. For many products, the ability to get to market first will outweigh the additional cost of Mexican labor.

Long lead times cannot be tolerated

In many cases, the long lead times and associated costs of manufacturing in China will disrupt a firm's existing operations. One apparel manufacturer jumping on a fashion trend ordered a container of velvet underwear from China; by the time it arrived, the fad had (thankfully) passed and the order was a complete loss.

Engineering or other corporate support required

The long distance and time difference between United States and Chinese operations makes close coordination difficult. In situations where a design team needs to work closely with production, or where being closely tuned to the market is a competitive advantage, Mexico offers an excellent alternative to expanding US operations.

Labor represents a significant portion of the product cost

In Mexico, as in China, the chief advantage of outsourcing will be to reduce labor expenses. In highly automated industries, the potential savings available simple doesn't justify the change in operations.

Conditions for Retaining or Expanding US Capacity

Some products are not good candidates for outsourcing to any nation, regardless of labor rates. In general, products meeting the following conditions should retain or expand their existing US operations.

Highly specialized products

Products that will be produced in low volume but require a large number of components may not be suitable candidates for exporting. Often this type of product requires specialized assembly skills that may not be available. In the case of custom-built products, interaction with the costumer during the production process may be required. Such interactions are complicated

significantly when production leaves the country.

Continuous flow operations

Continuous flow products, such as sugar or cereal, rely on a very high level of automation for production. These products use very little labor, but are capital intensive. Relocating of investing in new foreign capital equipment is unlikely to produce meaningful savings.

Services

Many services are clearly dependent on a local presence to support warranty service or other product support. Other services, such as technical support call centers, need not be located domestically. However, some US call centers that have

outsourced operations to Asia have brought them back to the United States, finding that domestic operations provide a better customer experience.

Just-in-time/Lean manufacturing

For truly lean manufacturing organizations, even the 4-5 day lead time for goods from Mexico will have an adverse impact on operations. Lean organizations need to closely examine the impact of outsourcing wherever it occurs in their supply chain.

Close design and corporate support required

Some products are successful because of their ability to tightly integrate design and marketing efforts with the production process. In these situations the advantages of maintaining a single-site corporate presence may outweigh the benefits of inexpensive labor.

Capital investment in place

Where a manufacturer has made significant investment in capital equipment, particularly for purposes of automating production, the disruption in operations may not be cost effective. Though automotive and durable goods manufacturers have outsourced some manufacturing, retooling or expanding existing capacity is often a viable alternative.

Returning to the Initial Questions

In the introduction, several questions were set out to be answered. Let us return to those questions:

What are the quantifiable savings of outsourcing?

Labor costs have received the most attention and are the most easily quantified. Yet significant variability in labor rates in both China and Mexico remains. Many companies have outsourced without closely quantifying either the benefits or the costs.

What factors of the outsourcing decision increase the total cost of operations?

Inventory carrying costs are one of the largest costs to outsourcing. These costs can be quite substantial when both domestic and in-transit inventory costs are considered. Shipping costs, the kind of product being produced, the amount of labor required, and overhead costs, and risk factors can also increase the total cost of operations.

How do these factors affect the decision to outsource operations to Mexico and China?

Before outsourcing to Mexico or China, an operations manager needs to have a strong grasp of the current operational picture. The benefits of outsourcing must be measured against other alternatives, such as product redesign and re-engineering of inventory processes. Yet for many retail products and an increasing number of other products, reduced labor costs can outweigh the costs of outsourcing.

And perhaps most importantly for an operations manager, when should a company:

- Outsource operations to China?

If producing high volume, low complexity products that can or do include a significant labor component in production, outsourcing to China can reap many benefits.

- Outsource operations in Mexico?
If you need to bring capacity on-line fast or need some level of regular interaction between the manufacturing plant and headquarters personnel, such as engineers, Mexico can provide inexpensive and skilled labor.

- Sustain or grow operations domestically instead?

If you are running a lean manufacturing operation, a highly automated production process, or are using a proprietary technology in your product, outsourcing probably won't be an attractive option. High quality or highly specialized work, even if labor intensive, will have to be retained domestically.

A successful outsourcing decision needs to incorporate a range of decision criteria; it can't have just a one-dimensional focus on low-cost labor. Decision makers have to weigh the various risks and benefits presented by different regions and countries. In China, for instance, companies face political uncertainty and weak enforcement of property rights, risks that could overwhelm the benefits of low labor costs. To manage such concerns, companies have to think of their global supply chain in a way that balances low costs against political, social and economic risks and proximity to key markets. While China may be the most attractive location for manufacturing many products on a simple costcomparison basis, it may be a better decision to accept higher unit costs in other countries in Asia, or Eastern Europe,

or countries in Latin America such as Mexico, or Brazil, etc. to protect against currency risks, social risks, political risks, or the impact of natural catastrophes.

Whatever the candidate product for outsourcing is, operations managers need to carefully weigh the choices. Even simple analytical models provide a means for coming to an objective conclusion about the risks of outsourcing, even in the face of uncertain market conditions. Most of the Americanmade products that were easy candidates for outsourcing have already left the country; the decisions regarding products that remain are not the easy ones, but there are still opportunities to reduce costs with careful strategic thinking.

Future Research Directions

Knowledge outsourcing is an incredibly significant force in the global economy and one that is rapidly evolving. The authors chose to limit their scope to manufacturing, however, which is more amenable to numerical and statistical analysis and also represents a significant force in global economics. For future research, the current model may be expanded to include knowledge outsourcing.

The purpose of this study is to demonstrate that the expectations of outsourcing do not always match up with realities in many industries. It may also be noted the purpose of the paper is not to provide a purely analytical tool, but to provide a template for practical guidance that can be applied in real business decisions. A more complex analytical model may be more pleasing to the pure researcher, but a model requiring complex inputs can only be used in rare situations. Simpler models pose the opportunity to be used and built upon in the laboratory of business. Similarly, we have provided background information with which the astute student of globalization may be intimately familiar. However, the authors feel that this background information provides an essential framework rarely presented in purely academic articles.

FIGURE B1

INTERIM RESULTS IN MODEL

THIS IS THE FULL-TEXT.

Descriptors: Decision making models; Outsourcing; Cost control; Costs; International; Studies

Classification Codes: 9180 (CN=International); 9130 (CN=Experimental/Theoretical); 2600 (CN=Management science/Operations research)
Print Media ID: 14340
Text:

...goods that were partially or wholly manufactured in China (Hua 2004). Software houses look to outsource support and coding to India and China, and more firms are outsourcing non-core processes...

...decision increase the total cost of operations?

* How do these factors affect the decision to outsource operations to Mexico and China?

Perhaps most importantly for an operations manager, when does it make economic sense for a company:

* To outsource operations to China?

* To outsource operations in Mexico?

* To mix operations in both Mexico and China?

* To sustain or grow...

...competencies (Hogan 2004, p. 12; Kim 2003), while leveraging the economies of scale of their outsource suppliers. By reducing risk and debt, the organization gains in flexibility (Fisher 2004, p. 13...

...house capabilities (Hogan 2004, p. 12).

Total Cost of Ownership Considerations

Total cost of ownership (TCO) is a process of analyzing supply chain activities and their associated costs with a particular supplier for a particular good or service. Ellram and Sieferd (1993) proposed TCO, but the general concept has been around prior to 1993 under a number of different...

...that Purchasing must understand the cost impacts of all Purchasing activities (Ferrin and Plank 2002). TCO is relevant not only for the firm that wants to reduce its cost of doing...

...and included in a total cost analysis.

A business enterprise can apply the practice of TCO to the strategic optimization of costs within the supply chain network. For example, a manufacturer...

...will have to determine the total cost of each alternative before making a decision. The TCO analysis should include the study of such

factors as:

* The manufacturability of the product (value...that while the model does not accommodate every element of the Total Cost of Ownership (TCO), the cost elements of quality, management overhead, shipping costs, and currency risk have been included...

...United States, China, or Mexico. The answer to the question of when and where to outsource, depends on many factors. In the rush to pursue cheaper labor rates, many companies fail...

...the tolerance of operations for delays in the supply chain.

In making a decision to outsource a product, a manufacturer should consider the product components and the volume of component that...

...support call centers, need not be located domestically. However, some US call centers that have outsourced operations to Asia have brought them back to the United States, finding that domestic operations...

...disruption in operations may not be cost effective. Though automotive and durable goods manufacturers have outsourced some manufacturing, retooling or expanding existing capacity is often a viable alternative. Returning to the...

...Yet significant variability in labor rates in both China and Mexico remains. Many companies have outsourced without closely quantifying either the benefits or the costs.

What factors of the outsourcing decision...

...also increase the total cost of operations.

How do these factors affect the decision to outsource operations to Mexico and China?

Before outsourcing to Mexico or China, an operations manager needs...

...costs of outsourcing.

And perhaps most importantly for an operations manager, when should a company:

- Outsource operations to China?

If producing high volume, low complexity products that can or do include a significant labor component in production, outsourcing to China can reap many benefits.

-

Outsource operations in Mexico?

If you need to bring capacity on-line fast or need some...

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01216991 171443506 5750462 (This Is The Fulltext)
A multidimensional framework for understanding outsourcing arrangements.

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Abstract:
The growth of outsourcing has resulted in numerous different outsourcing arrangements, ranging from out-tasking and managed services to business process outsourcing and transformational outsourcing. The growing lexicon of outsourcing terminology has caused confusion for many managers and academicians alike, who tend to view outsourcing as a fixed, discrete event or a simple make-or-buy decision. In reality, outsourcing is an umbrella term that includes a range of sourcing options that are external to the firm. Understanding these options, their characteristic differences, and how they serve to meet differing business objectives is the focus of the current research. Based on in-depth interviews with 19 senior executives experienced in outsourcing, as well as a thorough synthesis of available research, this article provides a framework clarifying the broad spectrum of outsourcing arrangements, and their inherent risks and advantages. Managerial guidance related to outsourcing is also provided.

Text:

INTRODUCTION

Outsourcing has become a megatrend in many industries, most particularly in logistics and supply chain management (Feeney, Lacity and Wilcox 2005). The overall scope of outsourcing is continuing to grow, as companies focus on their core competencies and shed tasks perceived as noncore (Lindner 2004). For example, recent data indicate that the outsourcing of human resources (HR) functions is pervasive, with 94 percent of firms outsourcing at least one major HR activity, and the majority of firms planning for outsourcing expansion (Gurchiek 2005). Research assessing the outsourcing of sales, marketing and administrative functions provides parallel results, with at least portions of these functions now being outsourced in 15-50 percent of sampled firms (The Outsourcing Institute 2005; GMA 2006). Similarly, the third- and fourth-party logistics industries are booming, with between 65 percent and 80 percent of U.S. manufacturing firms contracting with or considering use of a logistics service provider in the last year (Langley, van Dort, Ross, Topp, Sykes, Strata and Dengel 2006). Thus, managers are increasingly feeling pressure to make the right sourcing decision, as the business consequences can be significant (McGovern and

Quelch 2005). Good outsourcing decisions can result in lowered costs and competitive advantage, whereas poorly made outsourcing decisions can lead to a variety of problems, such as increased costs, disrupted service and even business failure (Cross 1995). Poor outsourcing practices can also lead to an unintended loss of operational-level knowledge. Consider the case of Toyota Motor Corp., which by outsourcing the design and manufacture of electrical systems for its automobiles, surrendered its own capability to understand the processes required for this highly specialized work. As a result, Toyota is no longer able to leverage its own technological advantage with respect to these systems during product development (Lindner 2004). Problems such as these and others related to the outsourcing of goods 1 and services are prevalent when outsourcing arrangements are not well understood by managers in the contracting firms.

Making the right outsourcing decision requires a clear understanding of the broad array of potential engagement options, risks and benefits, and the appropriateness of each potential arrangement for meeting business objectives. Many variations of outsourcing alternatives exist, resulting in a lexicon of terms, such as out-tasking, colocation, managed services and business process outsourcing. This has led to confusion for many managers, who feel pressure to make the right decisions and often view outsourcing as an all or nothing proposition to offload and bring down the costs of noncore activities. In fact, one of the biggest misconceptions about outsourcing is that it is a fixed event or a simple make-or-buy decision. In reality, outsourcing is an umbrella term that encompasses a spectrum of arrangements, each with unique advantages and risks. Understanding the relative risks and benefits of each of the potential alternatives is critical in making the right outsourcing decision.

Numerous outsourcing frameworks have been proposed to date. However, these frameworks have typically focused either on a narrow set of activities involved in the outsourcing decision, albeit in great detail, or on a narrow and nonexhaustive range of outsourcing options. Regardless of the frameworks, practicing managers have tended to adopt a one-size-fit-all perspective on outsourcing, with the belief that commodities and services are either handled in house, or allocated to a service provider, with little or no variation in the type of outsourcing arrangement. To remove the confusion surrounding this falsely perceived unidimensionality of the outsourcing decision, and simultaneously address the ambiguous and

constantly changing terminology used to characterize outsourcing phenomena, this article develops a comprehensive framework depicting the full range of outsourcing engagements. The framework provides a typology of outsourcing arrangements, as well as their characteristic differences, appropriateness for use and inherent risks. The framework is based on findings from in-depth interviews with 19 senior executives experienced in outsourcing, as integrated with a thorough synthesis of research available to date. The overarching goal of the framework is to provide a generalizable classification system for the broad spectrum of outsourcing arrangements under which many of the popular terminologies are subsumed.

Following the framework development, the article further explicates key decision points to help managers with their outsourcing decisions and provide researchers with a future research agenda related to the topic of outsourcing.

BACKGROUND

Outsourcing involves choosing a third party or an outside supplier to perform a task, function, or process, in order to incur business-level benefits. Outsourcing issues have been recognized and studied for many years using such nomenclature as "make-or-buy" (Hendrick and Moore 1985; Zenz 1987; Dobler and Burt 1996), vertical integration (Coase 1937; Stuckey and White 1993; Maltz 1994) and transaction cost analysis (Williamson 1985; Heide and John 1990; Maltz 1993; Stuckey and White 1993). Although the financial aspects of outsourcing continue to be important, outsourcing is increasingly taking on a broader organizational conception. Consequently, outsourcing has resource and strategic implications, in addition to the financial (e.g., transaction costs) concerns.

More recent research has increasingly focused on the strategic implications of the outsourcing decision (e.g., Brandes, Lilliecreutz and Brege 1997; McIvor 2000; Gould 2003; Lindner 2005). This research stream has recognized that financial implications of outsourcing are only one aspect to be considered and that outsourcing decisions must also be made with firm-level strategic goals in mind. Thus, this research has focused to some extent on the dangers of outsourcing, pointing to the risks that can result from loss of control and potential for opportunistic behavior (Amaral, Billington and Tsay 2003; Mentzer 2006). The findings from these articles indicate that outsourcing has the potential to serve as both the well-known and traditionally recognized cost-reduction calculus mentioned in the early literature, as well as a profit-generating activity base that, when aligned appropriately with the overall strategies of the firm, serves to enhance revenues by allowing for greater focus on those activities that the firm (and its customer base) consider most important. For example, a term frequently used in connection with outsourcing is "core competencies," evolving from the work of Hamel and Prahalad (1990). These authors' contention is that core competencies represent the true sources of competitive advantage on which firms should exclusively focus, and that firms should outsource all other activities deemed to be noncore (Venkatesan 1992; Quinn and Hilmer 1994; Hamel and Prahalad 1996; Quinn 1999).

In light of the relative importance of outsourcing to business, numerous frameworks have been suggested to date by researchers describing outsourcing arrangements. The earlier frameworks focused on outsourcing from the view of the purchasing function (i.e., Kraljic 1983; Leenders and Nollet 1984; Ellram and Billington 2001), attempting to explain why and how purchasing might want to seek specific commodities externally when attempting to satisfy the internal customer. More recent frameworks have addressed a wide array of related subjects from the supply chain management perspective, ranging from outlining the process of carrying out the outsourcing function (McIvor 2000) and understanding the drivers of the

outsourcing process (Maltz and Ellram 1999), to estimating the total cost of the outsourcing relationship (e.g., Total Cost of Ownership or TCO), which incorporates nonprice considerations into the make-or-buy decision (i.e., Maltz and Ellram 1997).

Fueled by the growth of the supply chain management paradigm and the understanding of the importance of relationship building, numerous frameworks have also been presented discussing partnership development within the outsourcing context (i.e., Lambert, Emmelhainz and Gardner 1996, 1999; Knemeyer, Corsi and Murphy 2003; Moberg and Speh 2003; Lambert, Knemeyer and Gardner 2004). Though these frameworks provide in-depth understanding of the respective issues they focus on, they are insufficient in that they look at only a small number of aspects of outsourcing, albeit in great depth. As such, even when integrated, they do not provide a comprehensive yet workable framework useful for practical implementation.

METHODOLOGY

Due to the lack of conceptual specifications for outsourcing in the current literature, a qualitative structured interview methodology (e.g., Schaeffer and Maynard 2003) was utilized. Qualitative methods are suggested as more appropriate for exploratory studies where conceptual discovery, clarification and interpretation of meaning is the research focus (Sayre 2001). Qualitative research has a longstanding tradition in the social sciences with abundant applications appearing across many subdisciplines. Such methods are most commonly employed when there is a need to discover underlying dimensions or relationships for a research concept (Rubin and Rubin 1995; Charmaz 2000), and/or where an inductive design is needed for the purposes of theory building (Creswell 1994; Locke 2001). Each of these conditions applies for the purposes of the current outsourcing project.

The initial step of the analysis used for developing the outsourcing framework involved a review and synthesis of the literature on outsourcing, focusing on the field of supply chain management and other related business disciplines. Following a comprehensive review of this literature base, a second, subsequent phase consisted of interview data collection directly from practitioners to elicit their views on the key issues involved in the outsourcing decision. This step included structured interviews with 19 senior executives experienced in outsourcing, all at the rank of Senior Vice President. The in-depth interview approach was selected to provide the best opportunity to identify and examine the outsourcing issues being experienced in practice by the sampled firms. Participants were specifically selected to provide a sampling of corporations having significant experience in outsourcing. Diversity was introduced into the sample by varying industries and sizes of the firms, types of products sold, and types of markets served. Descriptive data for the respondents' companies is provided in Table I. The criteria for executive selection included a minimum of 15 years of corporate experience, with a minimum of 5 years involved in outsourcing in their current corporation. Thus, the goal was to target and select seasoned executives with years of outsourcing

experience, i.e., those who would best be able to provide information related to the focal research topic.

The primary objective of the interviews was to gather information supporting the development of a usable framework that would encompass the full range of sourcing options, and thereby help to clarify and delineate the conceptual domain associated with outsourcing. In addition, a secondary goal was to capture the collective wisdom of executives having a great deal of experience in the outsourcing process, such that the framework could be built comprehensively and with external validity. To guide this process, an interview guide was developed to ensure that consistent information fields were gathered across sessions with the executives. The interview guide used was constructed and applied according to the guidelines set forth by Schaeffer and Maynard (2003) and Rubin and Rubin (1995). The specific issues addressed and identified during the interviews included the following:

* Criteria used to differentiate outsourcing engagements.

* Risks and benefits of different outsourcing engagements.

* Appropriateness for use of different outsourcing engagements.

* Reasons for outsourcing and how they relate to different types of engagements.

* Role of supplier relationships in outsourcing engagements.

* Unexpected issues/outcomes with different outsourcing engagements.

* Satisfaction with outsourcing.

* Advice they would give to others when making the outsourcing decision.

Given the importance of data quality to interpretative research, additional validity checks were executed as advocated by Erlandson, Harris, Skipper and Allen (1993), and Halldorsson and Aalstrup (2003). Per these authors, a trustworthiness approach approximating the quantitative concepts of internal validity, external validity, reliability and objectivity is achievable. The parallel qualitative concepts are described respectively as credibility, transferability, dependability and confirmability. Data credibility refers to the congruence between data responses and researchers' perception of intended meaning. Similar to Lambert et al. (2004), credibility was established in this study by confirming semantic meaning of ambiguous terminology and clarifying unexpected responses with the participants via follow-up questioning. Transferability refers to the potential that phenomena occur broadly or across contexts. This was addressed via sample frame design, which contained respondents having diverse industrial and experiential backgrounds. Dependability refers to the stability of measurement across the respondent pool; this was enforced in the current study by choosing the structured rather than un- or semistructured response format. In addition, an adequately large sample was

observed (c.f., Lincoln and Guba 1985 for this determination process). Confirmability refers to the ability of theories or concepts to be confirmed through data analysis. Interpretations of qualitative data should be traceable to their origins (Erlandson et al. 1993). The current study was well monitored and recorded. Full responses were written out and notes were kept recording the executive meetings, and any required edits generated through follow-up questioning were duly noted.

In order to establish meaning from the outsourcing executive interviews, content analysis was applied to the notes and transcripts taken during the interview process. Content analysis is a common technique used to classify written qualitative information (Krippendorff 1980). Two researchers acting as coders independently examined the data for each question, per the suggestions of Kolbe and Burnett (1991), and identified themes at the sentence level of analysis. The data was examined contextually versus corresponding questions on the survey instrument. The coders went through this process independently to ensure independence in the identification of themes across responses. After coding the themes, the coders discussed the responses and themes that had been identified to determine their level of agreement/disagreement.

When utilizing content analysis, it is important for researchers to remain objective in analyzing and describing the content in question. As recommended by Kassarjian (1977), two measures of reliability (i.e., category and interjudge) were incorporated to minimize subjectivity. Category reliability depends upon the development of categorical outsourcing definitions such that independent researchers agree on which items should be grouped together and which should not. After the researchers independently evaluated the content of each response, the categories of outsourcing were discussed in order to determine the true meaning of the concept and to ensure that coded statements were assigned to the appropriate categories.

Interjudge reliability refers to the consistency in which independent coders categorize content and is usually reported as a percentage. Interjudge reliability was calculated by summing the number of coding decisions the researchers agreed on and dividing by the total number of coding decisions, which is a common approach as identified by Kassarjian (1977). The first round of discussion of the coding decisions led to an interjudge reliability of 80.0 percent. Where disagreement between researchers occurred, items were discussed further such that the interjudge reliability on classification of responses rose to 100 percent.

DIMENSIONS OF OUTSOURCING

Based on the data collected in the qualitative interviews, two key categorical dimensions were identified by the executives as differentiating outsourcing engagements and serve as the foundation of our framework. The first is the scope of the outsourcing engagement, or degree of

responsibility assigned to the supplier. The greater the scope of the

outsourced task, the larger the relinquishing of control by the client. The second differentiating characteristic is criticality of the outsourced task to the primary activities of the client organization. Criticality is defined as the extent to which the task in question impacts the ability of the organization to perform its core competencies. The greater the criticality of the outsourced task, the greater the consequences of poor performance to the client and the greater the requirement for supplier management. These dimensions are now viewed in more detail and then built on in developing the research framework.

Scope

The primary differentiating characteristic between categories of outsourcing engagements is the scope of the function assigned to an outside supplier. At the simplest level it is the degree of responsibility assigned to a supplier, and associated relinquishing of control by the client, that differentiates types of outsourcing. At one extreme outsourcing can involve only one task outsourced from many possible tasks that comprise an entire function, such as outsourcing the replenishment of only MRO inventories (maintenance, repair and operating items). At another extreme it can involve outsourcing the management and even strategic direction of an entire operation or process. An example would be the comprehensive outsourcing of all aspects of the logistics function to a third-party logistics (3PL) service provider.

Based on feedback from executives and the comprehensive literature review, four broad categories of outsourcing engagements are identified that differ in terms of scope. These include out-tasking, co-managed services, managed services and full outsourcing. Numerous characteristic differences exist between these categories, and many variants of each arrangement are subsumed under each respective category. Nevertheless, creating a framework for the range of available outsourcing alternatives and their characteristics can help managers identify and develop the outsourcing strategy appropriate for their business. These categories of outsourcing are described in greater detail below.

1. Out-tasking. In the simplest form of outsourcing the responsibility for the performance of a specific task is assigned to an outside supplier. Here only one aspect of the total function is assigned to an outside party, rather than responsibility for the entire function. Responsibility assigned to the supplier is relatively small, confined and specific. In logistics, an example might be a supplier assigned to handle a client's returned inventories, arranging for item disposal or restocking.

2. Co-managed Services. This type of arrangement involves assigning a larger scoped task or function to the supplier compared with the previous engagement, however, under direct client control. Here client and supplier share responsibility for managing the tasks and assets, and in many cases work collaboratively. Although the overall function can have strategic

impact, it is the tasks with lesser strategic significance that are typically performed by the supplier.

3. Managed Services. The responsibility assigned to the supplier is larger in scope than that of the previous engagements. Here the client typically engages the supplier to design, implement and manage an end-to-end solution of a complete function, such as the complete management of a client's transportation systems. The supplier is now responsible for all aspects of the function, including equipment, facilities, staffing, software, implementation, management and ongoing improvement.

4. Full Outsourcing. In this arrangement, the client assigns total responsibility to the supplier for the design, implementation, management and often the strategic direction of the function, operation, or process. The services are typically highly customized to the business environment of the client.

Criticality

The second differentiating dimension for outsourcing arrangements is the criticality of the outsourced task or function. Out-tasking, at the one extreme, often involves assigning responsibility of a more tactical task or function to the supplier, rather than a strategic function. The task, therefore, typically has lower criticality to the organization. Full outsourcing, at the other end of the spectrum, often involves outsourcing a strategic and more critical responsibility. For example, a firm may outsource transportation, but retain control of all aspects of design, implementation and ongoing management of the logistics function. Although the degree of criticality often corresponds to task scope, this is not always the case. It is certainly possible to fully outsource a function or process with little critical importance, and it is possible to outsource one highly critical task as in the out-tasking engagement. However, such cases would be extremely rare and atypical.

The executives interviewed underscore that the higher the criticality of the outsourced function the greater the business risk to the client organization. For example, one executive stated: "We are aware that we incur a higher risk to our organization by outsourcing functions that are critical to our business. For that reason we have even brought critical functions back in-house that were outsourced in the past." As a result, this directly impacts the degree of supplier management required and the nature of the supplier-client relationship. When tasks with low criticality are outsourced, the relationship between client and supplier is primarily contractual and the client firm is focused on the transactional nature of the function outsourced. As criticality increases, the relationship moves from being solely contractual to becoming more relational. In simple out-tasking, when there is low criticality, the supplier has operational responsibility over a select nonstrategic task. The relationship is contractual and the client firm continues to have operational and managerial responsibility of all internal functions and process. As the outsourcing engagement becomes more comprehensive, however, the supplier increasingly becomes responsible for managerial and ultimately strategic aspects of the function.

(FIGURE 1 OMITTED)

EXPANDING THE FRAMEWORK: CLIENT-SUPPLIER RELATIONSHIPS

Considering task scope and criticality independently provides for a unidimensional perspective of outsourcing. A more comprehensive framework of outsourcing engagements is developed when both dimensions are considered simultaneously. For example, a large scope of outsourcing activity coupled with high criticality leads to more comprehensive outsourcing engagements and to different types of managerial requirements than are necessitated by the outsourcing of smaller scope and for less critical tasks. This framework results in differences in the nature of the client-supplier relationship and the responsibilities of each party. We identify four categories of relationship types that correspond to the four various combinations of levels of the two outsourcing dimensions. These are shown in Figure 1. The four outsourcing relationship types are described below.

1. Nonstrategic Transactions. This category encompasses the outsourcing of low criticality tasks with small or limited scope, resulting in outsourcing engagements that are solely transaction oriented, such as a simple commodity exchange. The product provided by the supplier is typically standardized and alternative sources of supply or market access are readily available.

2. Contractual Relationships. Contractual relationships reflect the need for greater control over business activity of suppliers (Rinehart, Myers and Eckert 2005). The scope of the outsourced task is higher than with nonstrategic transactions, though the function is still of low criticality to the organization. Moderate levels of communication frequency characterize this relationship, and unlike the case of the transactional relationship, dependence exists between the client and supplier.

3. Partnerships. This relationship type is characterized by the outsourcing of a critical task or function, albeit low in scope. The term "partnership" is used to connote strong and enduring trust between client and supplier, as well as a strong commitment to the relationship although the parties may not interact frequently. A variety of specific partnership arrangements are identified by Contractor and Lorange (1988). An example of this relationship could be the outsourcing of just-in-time replenishment of a critical manufacturing component.

4. Alliances. The most comprehensive outsourcing relationships occur when both criticality and scope of outsourced task are high. These arrangements are defined as alliance relationships, and reflect high interaction frequency, significant trust and commitment between client and supplier. Alliances presume a high level of confidence in the capabilities and integrity of the other party, and require significant resource investment in ongoing relationship management.

All of the executives interviewed identified significant supplier management requirements as one of the less anticipated results of the more comprehensive outsourcing engagements. For example, the executives expressed that the time commitment required for relationship management was far greater than expected and cautioned that client firms should have an internal infrastructure prepared for this type of ongoing relationship management. This is not to say that full outsourcing, which requires comprehensive relationship management, should not be undertaken. Rather, it means that client firms should not expect to just "hand over" responsibility to a supplier, and need to anticipate the organizational requirement of close relationship management. By contrast, less comprehensive outsourcing engagements, as exemplified by nonstrategic transactions and contractual relationships, primarily require performance monitoring rather than full relationship management resource investment.

Managers should understand the relationship requirements of the different types of outsourcing engagements and make their organizational plans accordingly. The number of comprehensive outsourcing engagements, such as alliance type relationships, must be kept small due to the extensive relationship management requirement. Relationships such as nonstrategic transactions, on the other hand, can be numerous as only monitoring efforts are required. Outsourcing engagements requiring a blend of relationship management and supplier monitoring, such as partnerships and contractual relationships, fall in the middle of the scale as shown in Figure 2.

ALIGNING BUSINESS OBJECTIVES WITH OUTSOURCING STRATEGY

The type of outsourcing engagement selected should be developed to support the business objectives motivating the outsourcing decision. Organizations choose to

outsource for a variety of reasons, such as cutting costs, accessing new skills, focusing on core competencies, or managing processes more effectively. Although many firms primarily outsource to cut costs and increase efficiencies (13 out of the 19 executives interviewed were primarily motivated by cost), the decision to outsource is far more complex and includes an increased focus on resource and strategic benefits. In fact, the remaining six executives identified these as the primary motivations for outsourcing. Outsourcing is increasingly becoming a strategic tool for many firms, as they engage the unique talents of highly skilled suppliers in strategically important tasks. In fact, outsourcing can enable client firms to acquire state of the art technologies and technical skills that would otherwise be unavailable to them (Lacity and Willcocks 1998). Three primary reasons for outsourcing were identified by the interviewed executives: financial, resource based and strategic.

(FIGURE 2 OMITTED)

Financial reasons focus on the minimization of costs, such as lowering labor cost, production cost, and increasing revenues. Unfortunately, the financial reasons possess two shortcomings. First, they typically focus on

per unit cost and often overlook the true total cost of the engagement (Lynch 2005). Second, financial drivers are often shortsighted in nature--managers outsourcing for financial reasons are often compelled to do so in response to short-term financial indicators. When concerned solely with minimizing costs, these managers will tend to follow a reactive, rather than a proactive, management approach. Financial indicators tend to serve as symptoms of problems, rather than leading to an enduring strategic rationale for outsourcing.

Alternatively, resource-based objectives focus on using outsourcing to compensate for a lack of expertise, such as technical know-how, the ability to keep pace with regulatory requirements, and/or address technological change. They can also be used to compensate for a lack of assets. These types of objectives have a broader vision in mind as cost is viewed as a by-product of resource efforts such as process improvement.

Similarly, strategic objectives look at outsourcing as an opportunity to develop proficiencies that can provide competitive differentiation. These objectives have the broadest vision in that they are internally focused on maintaining and developing capabilities and externally focused on how these capabilities can be leveraged in the marketplace.

(FIGURE 3 OMITTED)

The type of outsourcing engagement selected has to account for the reasons for outsourcing and the nature of the objectives the firm is trying to attain. When considering the decision to outsource, managers need to put time toward identifying the objectives they wish to accomplish with the outsourcing decision. Questions that need to be asked include: What business problem are we trying to solve? Is reducing cost or capital outlays the primary driver? Do we want access to technology? And, do we want a strategic partnership with a world-class provider of a core technology? Understanding the reasons behind the outsourcing decision is a key to providing a better fit with the type of outsourcing engagement selected.

More tactical-level outsourcing, as seen in out-tasking and co-managed services, is generally intended to meet financial cost objectives, overcome a short-term lack of capital necessary for asset acquisitions, or access a non-core capability. These arrangements can also be used to address a near-term capability gap. Out-tasking is also often used to broaden geographic reach, called geographic-based out-tasking. Rather than hire full-time employees to cover a large geographic region, companies often find that out-tasking can provide a lower cost and better time to market. Tactical outsourcing engagements such as these can move from financial to resource objectives for firms with a solid strategic direction and process management systems, but that need to reduce the costs and cycle time of deploying new capabilities. However, tactical outsourcing generally addresses financial and sometimes resource objectives; it does not address a firm's strategic requirements. This is shown in Figure 3. More comprehensive outsourcing engagements, as seen with managed services and full outsourcing, tend to have a strategic objective where the firm may be

willing to forego short-term financial benefits for long-term strategic positioning. These strategic goals may include developing a source of competitive advantage that may require an initial outlay of funds before profitability is realized.

Although more comprehensive outsourcing arrangements typically involve strategic objectives, the decision for any type of outsourcing engagement has a financial component, regardless of the primary reason for outsourcing. The interviewed executives identify that a major issue for c ompanies is correctly evaluating the costs of their sourcing strategies. Most companies cannot effectively determine the cost of goods and services consumed internally, including tangible and intangible costs. Ironically, outsourcing can facilitate greater understanding of cost structures for companies, as many suppliers have developed sophisticated mechanisms for monitoring the work they perform and reporting associated expenses.

COMPLETING THE FRAMEWORK: RISKS OF OUTSOURCING

In addition to identifying key reasons for outsourcing, client firms need to consider certain risks as part of the outsourcing decision making process. Risk is an inverse function of control. As a firm relinquishes more control through outsourced arrangements, it takes on more risk.
In general, more sophisticated outsourcing engagements bring greater benefits, but also involve significantly higher risks (Manuj and Mentzer 2007). As shown in Figure 4, a number of risk factors were identified by the executive respondents that should be considered before a firm passes more responsibility to external suppliers. These are outlined below.

Ability to Retain Control of Task

As the scope of the task passed to the supplier increases, the ability to retain control of the task or function decreases. Indeed, the sole purpose of outsourcing is to tap into the talent and unique capability of the supplier. Unless very specific outcome expectations are set up, however, the final outcome may not meet client expectations. Identifying key performance metrics and their values is a challenge, particularly for service types of tasks where the final "product" is intangible and often difficult to quantify. For small firms this can be particularly damaging as internal processes are less insulated from disruption.

This transfer of task control is a significant risk factor to consider. The decision to enter into an outsourcing engagement should include a thorough evaluation of the client firm's own capabilities versus that of the supplier. Often large client firms may find that they are equally effective at meeting expectations as an outside supplier, due to their large scale (Adler 2003).

Potential for Degradation of Critical Capability

One of the tenets of a well-run business is that it understands its core capabilities and how those capabilities help the business create value.

Therefore, as a general rule, firms do not outsource activities that directly contribute to their strategic, competitive advantage. Firms that are considering the outsourcing of such capabilities should recognize that they are putting execution at risk. Firms should also understand the relationship between core competencies and other related activities that provide no direct competitive advantage, but are highly interdependent with those that do. The company of one of the executives interviewed did precisely that. The company, a large national bank, brought IT services back in house that had been outsourced in the past. Although IT is not its core capability, it was impossible to separate IT services from its core capability, which was creating and delivering financial service products.

A company should also carefully consider outsourcing any function that may provide a competitive advantage in the future. Instead it should allocate resources to building this capability, even if outsourcing seems like an attractive option at the moment. Outsourcing is a good option, however, for functions that will not provide the company with a sustainable advantage or do not directly support core capabilities.

Dependency Risk

As a firm engages in more sophisticated outsourcing engagements it often customizes its operations to match those of its supplier. By doing so the firm may benefit by taking advantage of the supplier's economies of scale. This is particularly true in cases that require specialized technology and equipment, and specialized training of staff. However, customized arrangements are risky in that the firm can become overly dependent on the supplier. This can result in short-term problems, such as lack of performance on the part of the supplier that disrupts operations, and can also have strategic consequences, as the firm's future direction is tied to that of the supplier. The decision of whether to outsource should be based on the interdependence of the outsourced function with other internal processes (Aftuah 2003). Companies should avoid outsourcing highly integrated functions, particularly when significant adaptation with a supplier is required.

Pooling Risk

Many suppliers achieve economies of scale by aggregating the needs of different, sometimes competing, clients. Indeed, suppliers would not be able to offer a competitive advantage if it were not for the economies of scale that come from pooling the needs of many similar clients. However, this situation inherently creates certain risk factors. One such risk--proprietary risk--is the potential for client information to leak to an external party or be comingled with that of another client. This type of risk can be particularly damaging in the case of proprietary information, such as a unique technology or process. Proprietary risk increases when the function

outsourced is strategic in nature and is designed to provide a competitive advantage to the firm. Although various mitigation strategies can be used to minimize this occurrence, companies should carefully evaluate proprietary risk when deciding which functions to outsource and exercise due diligence with respect to the supplier in extracting the necessary contractual commitments.

(FIGURE 4 OMITTED)

Another type of pooling risk--contention risk--arises from the potential that a large number of clients may simultaneously compete for supplier services, which the supplier may then not be able to provide. This is especially true for suppliers with clients concentrated in a particular industry that may be suddenly subject to same government regulation or may want the same emerging technology. Suppliers do not have infinite capacity and resources, and thus typically balance these with the needs of many different clients. There is always the potential for lack of service at a time of critical need, if an external event forces a large number of clients to demand services. Although this is usually a relatively small risk due to the availability of subcontracting, its presence further underscores the importance of giving careful consideration to the outsourcing of critical functions.

Risk of Hidden Costs

This final risk is equally valid for all types of outsourcing engagements and relates to the risk of hidden costs associated with outsourcing. The executives interviewed all agree that unexpected costs are commonplace. The sheer number of variations of sourcing engagements creates ample opportunity for the client to omit, overlook, or underestimate many costs. One example is the omission of an important task in the contract of which the client was unaware or simply forgot to include. Here the supplier will perform the task, however, at an additional cost. Although this reflects more on poor contracting, it is still an unexpected cost. Another example is the underforecasting of work volumes by the client. In this case, the supplier may find the work volumes to be higher than anticipated by the client and charge accordingly. Hidden costs can also relate to unexpected communication technologies needed, particularly in the case of global sourcing, and the time requirement for relationship management (Artz and Brush 2000; Barthelemy 2001).

(FIGURE 5 OMITTED)

The potential for the discussed risks increases with the level of sourcing engagement, as do the potential benefits. This relationship is illustrated in Figure 5, which shows that less comprehensive sourcing engagements are more appropriate to meet financial or resource-based business objectives and they incur lower risks. By contrast, more comprehensive sourcing engagements are designed to meet more strategic business objectives but have the potential for greater risks.

MANAGERIAL IMPLICATIONS AND FUTURE RESEARCH

Only half of the executives interviewed were satisfied with their outsourcing engagements. This is consistent with recent research that reveals corporate satisfaction with outsourcing to be roughly at 50 percent (Gainey and Klaas 2003). Fifteen of the 19 executives expressed that a number of supplier management issues had been misjudged by their respective organizations. As these issues are paramount in formulating and executing a solid outsourcing strategy, our framework provides an approach to managing outsourcing arrangements effectively. A number of important additional considerations were also identified, and are discussed in closing.

Relationship Management

Our interviews reveal that the most underestimated issue in outsourcing is the challenge involved in managing the relationship. In fact, the executives state that the primary cause of failure of a satisfactory outcome is the inability to effectively manage the client-supplier relationship. This can be difficult despite clear contracts and preset service level agreements (SLA). It is not enough to simply hand over the task or function to the supplier. Rather, the ongoing collaboration ensures successful outcomes. A major concern for clients approaching an outsourcing engagement should be their ability to effectively manage a complex supplier relationship.

As criticality and/or scope of the outsourced tasks increase, the firm moves from a monitored relationship to a managed relationship (see Figure 2). Thus, relationship management is least important in out-tasking as the scope of the task is small, the product is standardized and the function is more tactical. Monitoring through good contractual agreements usually suffices at this stage. However, to engage in a more encompassing outsourcing strategy, such as managed services and full outsourcing, it is important for the client firm to first determine if it possesses the requisite relationship management skills, and to invest in building a "relationship architecture" for the purpose of ensuring that there is an appropriate underlying relational design or structure for the alignment between their organization and the supplier. Client firms should also take time to determine the type of relationship they seek to develop, such as whether it is purely cost driven versus focused on strategic partnering, and ensure that there is alignment within their organization in dealing with the supplier. For most companies, this is an unexpected requirement of the outsourcing engagement and is yet another "hidden cost."

An important element of building an effective "relationship architecture" is a joint communication plan. The broader the scope of the outsourcing engagement, the more important it becomes to proactively communicate strategic intention, expectations, timeliness and business benefits to the client's employees and key stakeholders. In most cases the very people who will have to help the outsourcer integrate their activities into the client's are the ones most threatened by this new business arrangement. Addressing these kinds of concerns early and publicly (even if employees do

not like what they hear) can improve the success of these arrangements by focusing employees on what needs to be done and minimizing the likelihood that employees will deliberately undermine the arrangement.

Our framework is especially relevant to research in the relationship marketing paradigm (Morgan and Hunt 1994) that currently dominates business to business marketing. This literature argues for the use of relational management for business to business transactions. However, we propose that the effectiveness of relational marketing techniques will be contingent on the criticality and scope of the task being outsourced.

Contract Management

All the executives agreed that contracting and negotiation are critical components regardless of the outsourcing engagement. Contracts with clearly specified service-level agreements are a must for a successful relationship, despite their potentially high cost to develop. Some supplier-client contracts are valued in the billions of dollars and need to be carefully crafted by skilled attorneys. In fact, of the 19 executives interviewed 13 were disappointed with the service levels provided and reported having had some degree of contractual dispute with their suppliers. The contracting process can be so resource intensive that some companies are in the business to manage it entirely, including evaluating sourcing alternatives, conducting negotiations and putting the contractual relationship in place.

As relationships move from monitored to managed, the specification of the change process becomes more important. This is essential as either party's organizational climate can literally change overnight with a change in leadership, as happened with some of the interviewed executives. Modifications to the initial contract are inevitable, usually in the form of addendums, as the business changes. When relying on more relationally oriented management of the supplier (e.g., alliances), it is expected that commitment and trust will develop through the process of transacting (Morgan and Hunt 1994). However, while contracts are important, the relationship will develop over time and change as needed. In addition to the initial cost of writing the contract, firms need to be prepared that ongoing change management will be an inevitable facet of the long-term relationship and should plan accordingly.

Our study also informs future alliance research, especially the ability of a buyer-supplier relationship providing a competitive advantage when task scope and/or criticality are low because the objective of the outsourced arrangement will be more financial (see Figure 3). As the objectives for the outsourced task move from financially oriented to more resource and strategic oriented, the degree to which the relationship could be a source of competitive advantage increases. Therefore, competitive advantage of a buyer-supplier relationship is contingent upon the degree of criticality and scope of the task being outsourced.

Firm Size

A number of executives noted the role of firm size in the outsourcing decision. Small and medium-size firms often have smaller budgets and an organizational infrastructure with less clear delineation between strategic and tactical functions. Outsourcing engagements can, therefore, be especially risky for smaller firms (see Figure 2). For smaller firms, all tasks will generally have a higher degree of scope and criticality. These firms may also lack specialized skills that may be required for more elaborate outsourcing engagements. In fact, a recent survey finds that small and midsize firms may have unrealistic expectations of the outsourcing experience (Brown 2003). In contrast, large firms may not have the same problem of getting the right amount of attention from large suppliers. However, larger firms may be frustrated to find that they have the required talent hidden internally due to their size, and could avoid some of the identified risks through internal sourcing, if their organizational structure facilitates the alignment of key people to critical processes. Future research should explore the effect of firm size on the degree of scope and criticality of tasks.

CONCLUSION

This article presents a comprehensive framework of outsourcing engagements, their characteristics, and variations. While there is a wealth of best practices and lessons learned, there is no "one size fits all" sourcing strategy. Rather, the selected sourcing strategy must always be based on the current and unique needs of the firm. As businesses evolve and develop greater capabilities, their sourcing requirements change. Consequently, the selection of outsourcing engagements should be flexible and dynamic, rather than a rigid and static decision process. In deciding on the best sourcing strategy firms should carefully consider their business objectives for outsourcing, carefully evaluate potential risks and not fall prey to the apparent momentum of the outsourcing movement. As results of our interviews demonstrate, there are many hidden costs and unexpected challenges, particularly as companies engage in more sophisticated outsourcing engagements.

Our outsourcing framework ties together the full range of outsourcing issues, including scope and criticality of

outsourced tasks, type of supplier relationships, and risks and business objectives. Although simplistic, the framework is informative in showing that the achievement of specific business objectives is tied directly to the specific type of outsourcing arrangement selected, and carries with it associated risks. Although managers may ultimately decide to adapt the outsourcing categories presented to their own scenarios, the basic relationships between business objectives, risks, task scope and criticality will remain unchanged.

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Appendix

Structured Interview Guide

* Opening -- Introduction of researchers and purpose of the study; assurance of confidentiality.

* Demographic Data Collection -- Establishment of participant titles, background of organization, industry, number of suppliers and company's outsourcing history.

* Research Questions:

** In your opinion, what are the different types of outsourcing engagements?

** What criteria are you using to differentiate outsourcing engagements?
** In your opinion, when is it appropriate for a company to use each of the different types of outsourcing engagements?

** What are the risks of each of the different outsourcing engagements?

** What are the benefits of each of the different outsourcing engagements?

** In your experience, what are the reasons companies outsource and how do they relate to the different types of outsourcing engagements?

** What is the role of supplier relationships in each of the outsourcing engagements?

** What unexpected issues/outcomes can be experienced with each of the different outsourcing engagements?

* What has been your company's overall satisfaction with outsourcing?

** Based on your experience, what advice would you give to others to consider when making the outsourcing decision?

* Prompts:

** Can you tell me more about that?
** Can you give more detail?

** Can you give an example?

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(1) The bulk of our discussion refers to outsourcing of services, processes, and functions. Manufacturing of parts, sub-assemblies, etc. is already subsumed within the framework. Recent research (Vargo and Lusch 2004) indicates that the services rendered by products such as these are in fact the value-adding component of the offering. Hence, firms really do not outsource parts; they outsource the manufacturing of parts. Thus, tangible goods are implicitly included in the "functions" category above (i.e., manufacturing operations is a firm-level function). We have clarified this further in the text. We would like to thank an anonymous reviewer for raising the issue.

Table I PROFILE OF INTERVIEW RESPONDENTS

FIRM	Industry	Annual Revenues (in millions of dollars)	No. of Employees	Industry Type
No. 1	Personal computer manufacturer	79,905.00	151,000	Manufacturing
No. 2	Health care service provider	72,380.00	122,000	Service
No. 3	Banking and financial services	56,931.0	160,968	Service
No. 4	Software developer	36,835.00	57,000	Manufacturing
No. 5	Package delivery company	36,582.00	384,000	Service
No. 6	Telephony service provider	30,537.00	47,600	Service
No. 7	Soft drink manufacturer	29,261.00	153,000	Manufacturing
No. 8	Auto parts manufacturer	28,096.00	190,000	Manufacturer
No. 9	Banking	25,168.00	175,000	Service
No. 10	Internet equipment manufacturer	22,045.00	34,000	Manufacturing
No. 11	Retailer	16,267.00	152,000	Service
No. 12	Enterprise software developer	10,156.00	41,658	Manufacturing
No. 13	Telecom equipment	9,045.00	31,800	Manufacturing

	manufacturer			
No. 14	Automatic teller machine manufacturer	5,984.00	28,500	Manufacturing
No. 15	Insurance provider	4,180.20	5,000	Service
No. 16	Retailer	3,121.00	5,210	Service
No. 17	Printer of business documents	890.20	4,070	Manufacturing
No. 18	Retailer	540.20	3,120	Service
No. 19	Delivery service provider	10.60	150	Service

Cited References:

Special Features: Table
Company Department Name: General Business; Marketing & Sales
Product Names: Application Service Providers, Internet (737510)
Concept Terms: Customer relations; Outsourcing; Trends
Geographic Names: North America (NOAX); United States (USA) (Use Format 7 Or 9 For Fulltext)

Text:

...and administrative functions provides parallel results, with at least portions of these functions now being outsourced in 15-50 percent of sampled firms (The Outsourcing Institute 2005; GMA 2006). Similarly, the...

...true sources of competitive advantage on which firms should exclusively focus, and that firms should outsource all other activities deemed to be noncore (Venkatesan 1992; Quinn and Hilmer 1994; Hamel and...

...from the view of the purchasing function (i.e., Kraljic 1983; Leenders and Nollet 1984; Ellram and Billington 2001), attempting to explain why and how purchasing might want to seek specific...

...the outsourcing function (McIvor 2000) and understanding the drivers of the outsourcing process (Maltz and Ellram 1999), to estimating the total cost of the outsourcing relationship (e.g., Total Cost of Ownership or TCO), which incorporates nonprice considerations into the make-or-buy decision (i.e., Maltz and Ellram 1997).

Fueled by the growth of the supply chain management paradigm and the

understanding of...

...engagement, or degree of responsibility assigned to the supplier. The greater the scope of the outsourced task, the larger the relinquishing of control by the client. The second differentiating characteristic is criticality of the outsourced task to the primary activities of the client organization. Criticality is defined as the extent ...

...ability of the organization to perform its core competencies. The greater the criticality of the outsourced task, the greater the consequences of poor performance to the client and the greater the...

...client, that differentiates types of outsourcing. At one extreme outsourcing can involve only one task outsourced from many possible tasks that comprise an entire function, such as outsourcing the replenishment of...

...the client.

Criticality

The second differentiating dimension for outsourcing arrangements is the criticality of the outsourced task or function. Out-tasking, at the one extreme, often involves assigning responsibility of a...

...spectrum, often involves outsourcing a strategic and more critical responsibility. For example, a firm may outsource transportation, but retain control of all aspects of design, implementation and ongoing management of the...

...to task scope, this is not always the case. It is certainly possible to fully outsource a function or process with little critical importance, and it is possible to outsource one highly critical task as in the out-tasking engagement. However, such cases would be extremely rare and atypical.

The executives interviewed underscore that the higher the criticality of the outsourced function the greater the business risk to the client organization. For example, one executive stated...

...business. For that reason we have even brought critical functions back in-house that were outsourced in the past." As a result, this directly impacts the degree of supplier management required and the nature of the supplier-client relationship. When tasks with low criticality are outsourced, the relationship between client and supplier is primarily contractual and the client firm is focused on the transactional nature of the function outsourced. As criticality increases, the relationship moves from being solely contractual to becoming more relational. In...control over business activity of suppliers (Rinehart, Myers and Eckert 2005). The scope of the outsourced task is higher than with nonstrategic transactions, though the function is still of low criticality...

...component.

4. Alliances. The most comprehensive outsourcing relationships occur when both criticality and scope of outsourced task are high. These arrangements are defined as alliance relationships, and reflect high interaction frequency...

...should be developed to support the business objectives motivating the outsourcing decision. Organizations choose to outsource for a variety of reasons, such as cutting costs, accessing new skills, focusing on core competencies, or managing processes more effectively. Although many firms primarily outsource to cut costs and increase efficiencies (13 out of the 19 executives interviewed were primarily motivated by cost), the decision to outsource is far more complex and includes an increased focus on resource and strategic benefits. In...

...nature of the objectives the firm is trying to attain. When considering the decision to outsource, managers need to put time toward identifying the objectives they wish to accomplish with the...

...process. Risk is an inverse function of control. As a firm relinquishes more control through outsourced arrangements, it takes on more risk. In general, more sophisticated outsourcing engagements bring greater benefits...

...those capabilities help the business create value. Therefore, as a general rule, firms do not outsource activities that directly contribute to their strategic, competitive advantage. Firms that are considering the outsourcing...

...The company, a large national bank, brought IT services back in house that had been outsourced in the past. Although IT is not its core capability, it was impossible to separate...

...s future direction is tied to that of the supplier. The decision of whether to outsource should be based on the interdependence of the outsourced function with other internal processes (Aftuah 2003). Companies should avoid outsourcing highly integrated functions, particularly...

...proprietary information, such as a unique technology or process. Proprietary risk increases when the function outsourced is strategic in nature and is designed to provide a competitive advantage to the firm...

...to minimize this occurrence, companies should carefully evaluate proprietary risk when deciding which functions to outsource and exercise due diligence with respect to the supplier in extracting the necessary contractual commitments...

...ability to effectively manage a complex supplier relationship.

As criticality and/or scope of the outsourced tasks increase, the firm moves from a monitored relationship to a managed relationship (see Figure...

...and key stakeholders. In most cases the very people who will have to help the outsourcer integrate their activities into the client's are the ones most threatened by this new...

...relational marketing techniques will be contingent on the criticality and scope of the task being outsourced.

Contract Management

All the executives agreed that contracting and negotiation are critical components regardless of...

...competitive advantage when task scope and/or criticality are low because the objective of the outsourced arrangement will be more financial (see Figure 3). As the objectives for the outsourced task move from financially oriented to more resource and strategic oriented, the degree to which...

...supplier relationship is contingent upon the degree of criticality and scope of the task being outsourced.

Firm Size

A number of executives noted the role of firm size in the outsourcing...

...outsourcing framework ties together the full range of outsourcing issues, including scope and criticality of outsourced tasks, type of supplier relationships, and risks and business objectives. Although simplistic, the framework is...

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...of each of the different outsourcing engagements?

** In your experience, what are the reasons companies outsource and how do they relate to the different types of outsourcing engagements?

** What is the...

...are in fact the value-adding component of the offering. Hence, firms really do not outsource parts; they outsource the manufacturing of parts. Thus, tangible goods are implicitly included in the "functions" category above...

? Logoff Hold

Estimated Cost Summary

Project		Client		Charge Code		Searcher		Job		Service Code	User Number
						Scott Jarrett				51	276702
Date		Time		SessionID		Subsession		Subaccount			
01/21/2009		14:37:37		167		11					
Data Base	Dial Units	Access Charge	Print Credit	Types	Prints	Report	Rank	Links	CSS	Total	
9	0.0280	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	
11	0.0280	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	
13	0.1310	0.73	0.00	3.79	0.00	0.00	0.00	0.00	0.00	4.52	
15	0.3770	2.10	0.00	7.58	0.00	0.00	0.00	0.00	0.00	9.68	
47	0.0280	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	
75	0.0160	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	
88	0.0520	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	
148	0.1350	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	
262	0.0280	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	
484	0.0910	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	
485	0.0320	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	
990	0.0630	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	
991	0.1350	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	
992	0.1190	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	
993	0.0670	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	
994	0.0320	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	
995	0.0600	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	

996	0.0950	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42
Sub Totals	1.5170	$7.62	$0.00	$11.37	$0.00	$0.00	$0.00	$0.00	$0.00	$18.99
Session Totals	94.4030	$298.67		Telecom	$0.59					$310.63

```
Holding session beginning:  1/21/2009 2:37:40 PM

Just enter a command to reestablish your session


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